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COMMERCIAL FISHERIES REVIEW

VOL. 27, NO. 8 AUGUST 1965

UNITED STATES DEPARTMENT OF THE INTERIOR
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Bureau of Commercial Fisheries
Washington, D.C.

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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

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COMMERCIAL FISHERIES REVIEW

August 1965 Washington, D. C. Vol. 27, No. 8

HERRING FISHERY IN SOUTHEASTERN ALASKA

By Stephen H. Rogers*

A limited fishery for herring (Clupea harengus pallasii) exists in Southeastern Alaska (see table). The herring is processed for meal and oil.

Herring Catch in Alaska 1/

Year	Catch	Value
	1,000 Lbs.	$
1964	50,000 2/	-
1963	31,216	468,240
1962	33,876	379,320
1961	49,465	559,020
1960	77,913	835,675

1/Includes catch used for bait.
2/Preliminary figure.

One plant located at Washington Bay can process 2,100 barrels 1/ of herring in 24 hours when running at full capacity. Oil recovery during 1964 has been unusually high with an average yield of 45 gallons per ton. About 3½ barrels of herring are required to produce 100 pounds of meal. Delivery to the plant varies with the availability of fish. When fish are available, the vessels deliver every day. The plant has two shifts; 7 workers on the day shift and 6 at night.

During 1963, only one herring reduction plant operated in Alaska; in 1964, a second plant reopened because of improvement in the market. The herring plants must produce a much larger quantity than in the past to compete with the South American meal and oil producers. One plant in Washington Bay now processes nearly four times as much herring as it did during earlier years.

Fig. 1 - When a school of herring is spotted near the surface, the seine set is started by launching the skiff which holds the end of the 250-fathom purse seine, while the seiner pays out the net and encircles the school.

Fig. 2 - The 80-foot seiner Pacific Pride. The seine used is 250 fathoms long and seven 200-mesh strips deep. The mesh size is 1⅜" stretched. All nylon web is used.

The fishing season for herring is from June 1 (June 15 in some areas) to February 23. Usually there is no fishing after September because the fish are not readily available to the seiners. During the first part of the 1964 season, fishing was in the Noyes Island area. Later, landings came from Turnabout Island, Gut Bay, Cape Fanshaw, and Larch Bay.

*Fishery Aide, Exploratory Fishing & Gear Research Base, U.S. Bureau of Commercial Fisheries, Juneau, Alaska

1/One barrel of herring contains 250 pounds of fish.

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Fish and Wildlife Service
Sep. No. 738

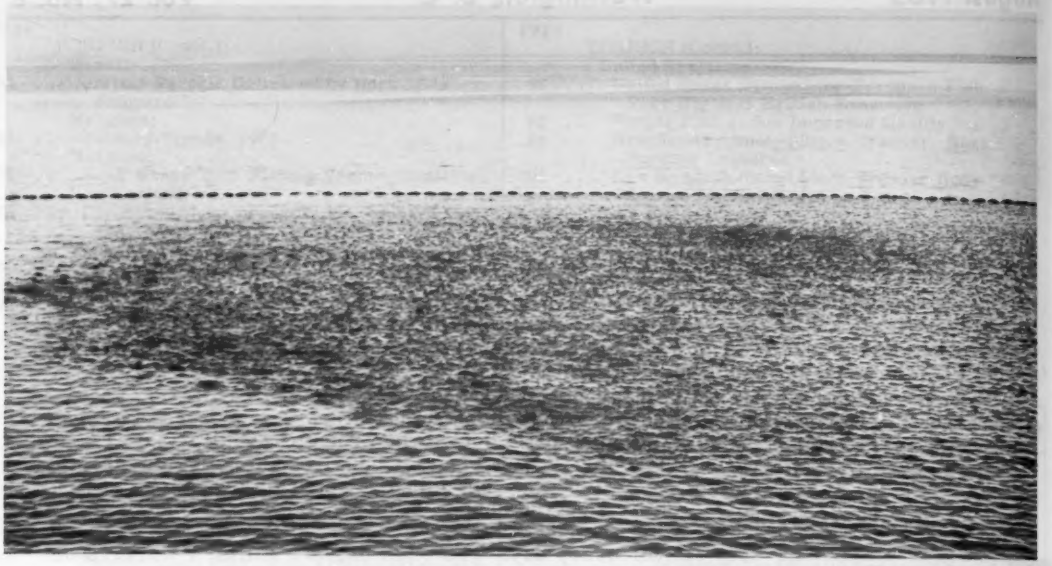

Fig. 3 - A school of herring is enclosed by the seine.

Early in the fishing season, most fishing is done during the day, while in the latter portion of the season (August and September) more night fishing is carried on. A set is made when a sufficiently large school of fish is spotted near the surface. At night, the fish are spotted by the luminescence caused when they disturb the surface of the water. The seine is set to circle the herring school. About 45 minutes is required to complete the operation. A large brailer composed of an iron ring and a nylon web bag brings the catch aboard the vessel. This net transfers up to 25 barrels of herring in a single lift.

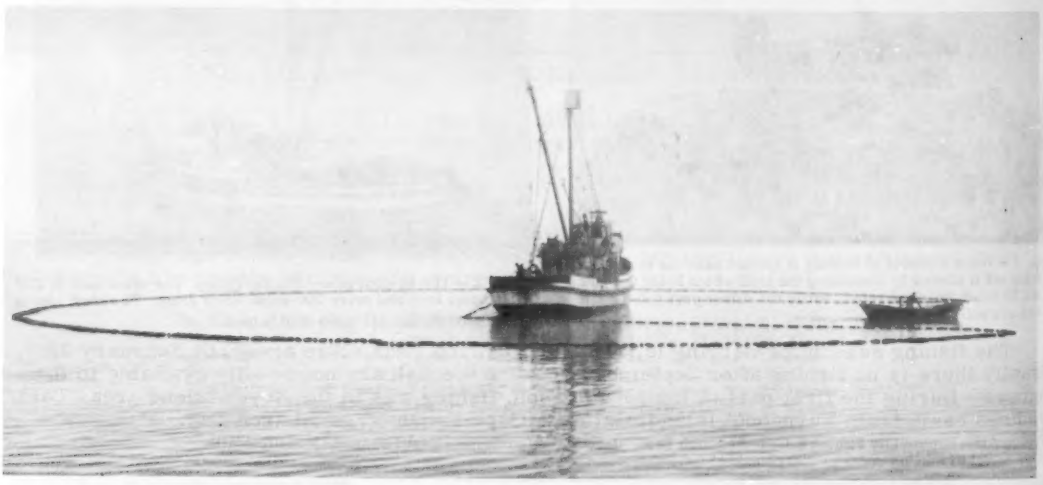

Fig. 4 - The set is complete. The seine is now being pursed as the skiff tows the main vessel or seiner to keep her from drifting into the seine.

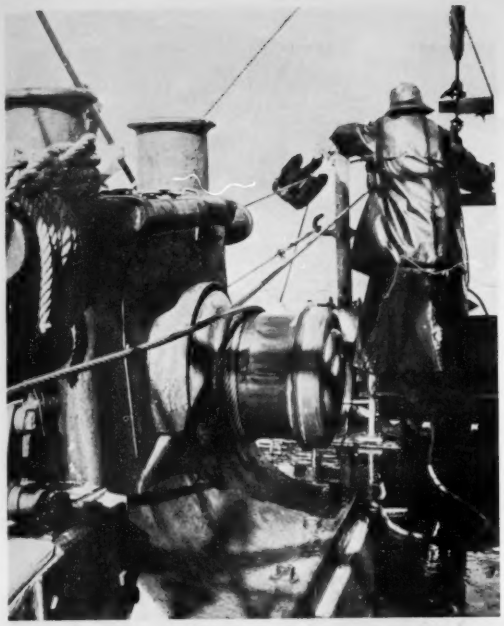

Fig. 5 - The purse cable is being winched aboard. The cable is wound on a drum.

Fig. - 6 After the net is pursed, trapping the fish, the purse rings are brought aboard in preparation for hauling the seine aboard.

Fig. 7 - A power block is pulling the seine aboard. All herring seiners now use power blocks, which speed up operation considerably.

Fig. 8 - The crew of the seiner American Star is stacking the seine on the deck. An 8-man crew is employed, consisting of captain, engineer, cook, and 5 deckhands.

Nine seiners were fishing herring in Alaska in 1964; an increase of 5 vessels over 1963. All the herring vessels are similar, between 75 feet and 85 feet long. The larger vessels carry 900 to 1,200 barrels below decks.

Fig. 9 - The net is now back on the seiner's deck, except for the bunt or section containing the fish. The bunt is located at the "skiff end" of the seine. The crew is pulling the last of the seine aboard to concentrate the catch for loading the fish (brailing).

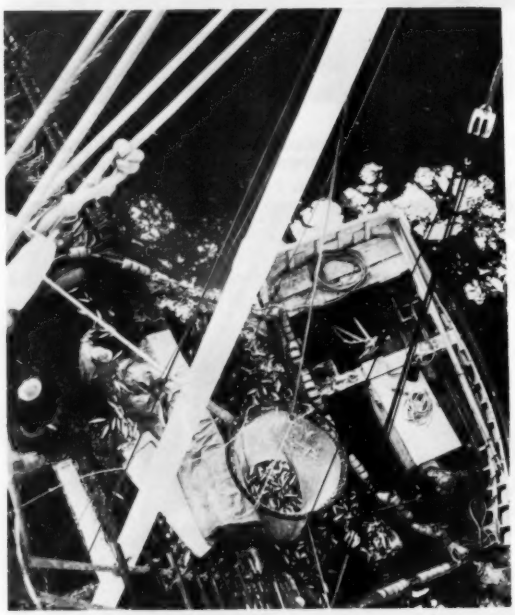

Fig. 11 - The fish are being brailed aboard with a long-handled brailer made of nylon web.

A typical seine is 240 fathoms long and seven 200-mesh strips deep ($1\frac{3}{8}$" mesh). The leadline is manila and the corkline is nylon with plastic floats. Some vessels use a galvanized chain leadline or polypropylene with lead weights.

Fig. 10 - A catch of about 200 barrels of herring is ready to be brailed aboard. The American Star can carry 900 barrels of herring in her hold; some of the larger vessels can carry more than 1,200 barrels.

Fig. 12 - A brailer full of fish coming aboard the seiner.

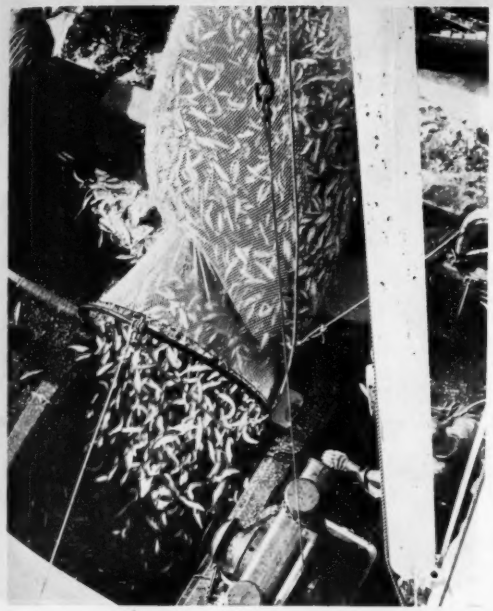

Fig. 13 - The fish are spilled into the hold.

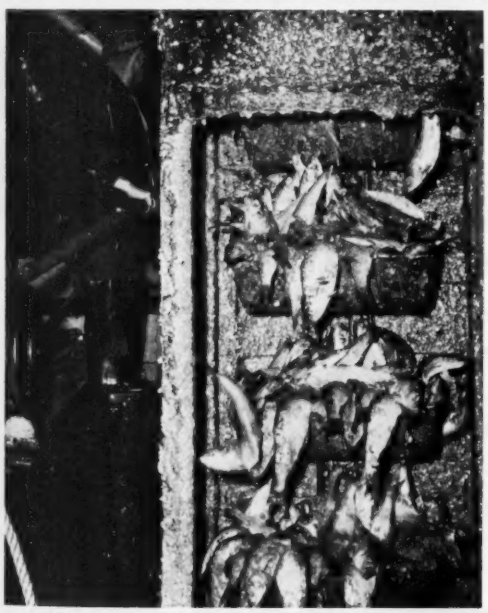

Fig. 15 - The herring are unloaded by conveyor from the hold of the seiner.

Fig. 14 - The herring reduction plant at Washington Bay.

Fig. 16 - The fish are stored in a tank at the plant.

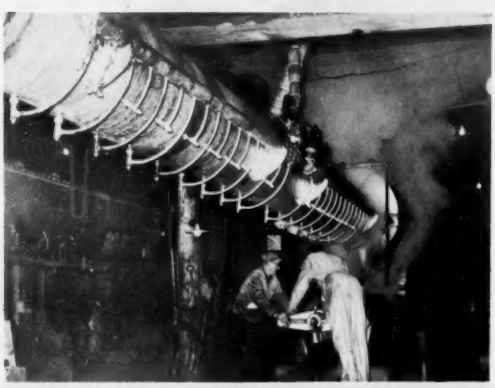

Fig. 17 - After the fish are cooked, the oil is pressed out. During 1964, most of the fish were 6 years old, with an unusually high oil content.

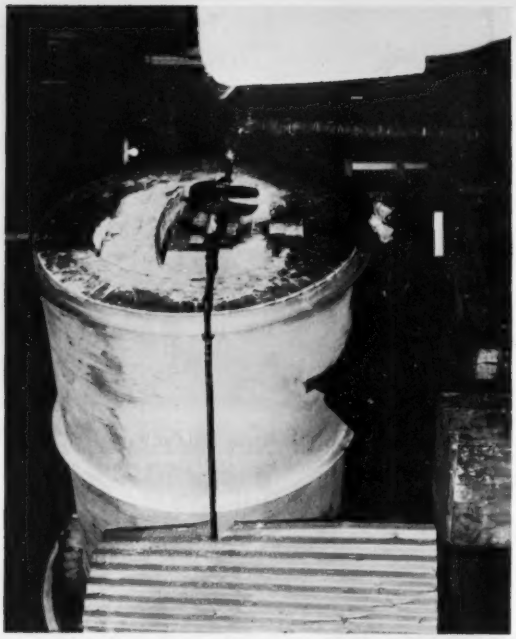

Fig. 18 - After the oil is "pressed" out, the residue is dried in a flame dryer.

Fig. 19 - The dried fish meal is being sacked.

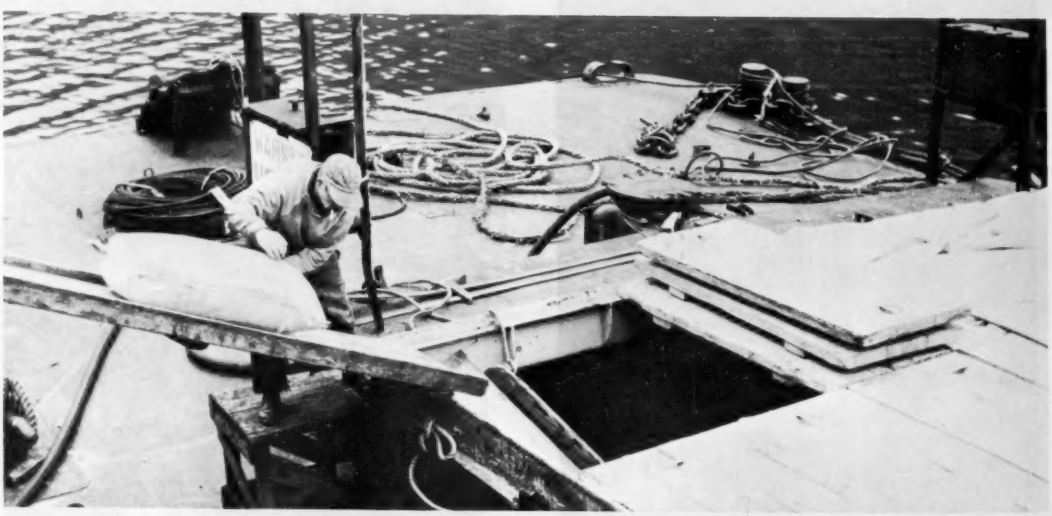

Fig. 20 - The sacks of meal are being loaded aboard a barge for shipment to Seattle.

Boat-owners from one of the plants have recently employed an airplane to spot fish but the long-term results of using this method of locating schools of fish are not yet known.

THE YELLOWFIN TUNA FISHERY IN THE EASTERN TROPICAL ATLANTIC

(Preliminary Study)[1]

By J. C. LeGuen, F. Poinsard and J. P. Troadec

(Translated from French by J. P. Wise*)

ABSTRACT

This study presents the results of an investigation carried out on the live-bait tuna clippers which landed their catches at Point Noire (Congo-Brazzaville) in 1964. Two-thirds of the trips were analyzed. The analysis allows us to describe the characteristics of the live-bait fishery in the region: catch per unit of effort, yield, and the gross relationship between the distribution of the concentrations of yellowfin and the oceanographic structure of the surface. Eighty percent of the catches were made in waters of 24° to 25° C. (the frontal zone). This relationship makes it possible to use knowledge of the oceanography of the surface, and its seasonal variations, in scouting for fish.

I. INTRODUCTION

The yellowfin (Thunnus albacares) fishery actually began in the Point Noire (Congo-Brazzaville) area in September 1963 with the construction of cold-storage facilities. After 10 years of attempts (cruises of the vessels Laurence, Columbia, Marinero, and Bertin), there had been no commercial exploitation established because the distances between the fishing areas and the ports prejudiced the economic yield.

Since the arrival of the tuna fleet in September 1963 we have begun an investigation to determine the principal characteristics of the fishery (yields) in the region and to obtain the first estimates of the seasonal movements of the fish concentrations.

In establishing contacts with the fishing captains we tried to obtain as much information as possible about their trips: duration, position, catch, time devoted to catching bait, surface temperature, and average size of fish captured. In spite of the relative imprecision of some of the information, this method has the advantage of furnishing a synoptic picture of the situation and a large number of observations (at least in the region exploited). In addition, this type of analysis is the only one permitting the beginning of a study of the influence of exploitation on the stock.

The results of the study are particularly satisfactory in that they shed light on the problem of seasonal movements of the concentrations of yellowfin. Monthly charts[2] of the relative abundance of the fish at the surface have been constructed; they furnish a partial picture of the migrations.

The work presented in this paper is the result of a rapid analysis of the data collected during 1964. This preliminary version was written with as little delay as possible in order to make the results available to the tuna fleet before the beginning of the 1965 fishing season.

II. DESCRIPTION OF THE WORK

Our first idea was to give to the fishing skippers a log sheet to fill day by day at the same time they filled their own logs.

*Fishery Biologist (Research), Washington Biological Laboratory, U.S. Bureau of Commercial Fisheries, Washington, D.C.

1/"La pêche de l'albacore (Neothunnus albacares Bonnaterre) dans la zone orientale de l'Atlantique intertropical - Etude preliminaire," Document No. 263 - S.R., 1965. Travaux du Centre Océanographique de l'Office de la Recherche Scientifique et Technique Outre-Mer à Pointe Noire, Direction Générale: 24, rue Bayard, Paris (8e)- Centre O.R.S.T.O.M. de Pointe Noire: B.P. 1086, République du Congo.

2/Available as an appendix attached to the reprint (Sep. No. 739) of this article.

Notes: (1) Metric tons and °C. used in this article.

(2) Certain changes have been made by the Editor to increase readability in English. Also included are slight modifications as suggested by the authors.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 739

O.R.S.T.O.M.
Centre d'Oceanographie
de Pointe-Noire
B.P. 1086 - Congo

Tonnage Landed

Yellowfin_____
Big-eye (> 30 kg) _____
Skipjack_____

TOTAL

CAPTURES

Name of the boat_____
Sailing date _____
Landing date_____

Captain's Name_____
Length of trip _____ days

BAIT

Number of days . . . . . .
Location. . . . . .
Weight . . . . . .
Species . . . . . .
Average size. . . . . .

1	2	3	4

TUNAS*

Half-Month Period	Date	Position (Statistical Square)	Number of Hours in This Square	Surface Water Temp.	Tonnage Captured	Description	
						Species	Average Size

*Fill this out every day, even if you see no tuna during the day.

Fig. 1 - Form of daily log sheet distributed for use by fishing skippers. (Original printed in French.)

Unfortunately, in practice we were only able to obtain the information regularly by going aboard ourselves to copy the fishing logs, or, if these had not been kept, by interviewing the captains. The precision of information varied considerably from boat to boat. It depended on the good will of the captains and the care with which their logs were kept. While some logs gave day by day all the information needed, others did not even exist; our investigation then was based only on oral information. The sheets filled out under the latter conditions only give overall information, such as: "so many tons in so many days in such and such a region," or even more roughly, "trip identical to that made by such and such a boat."

We attempted to record all the trips which landed their catches at Point Noire. But we only covered 70 of the 113 trips in 1964, that is 4,194 metric tons out of the 6,875 metric tons landed (two-thirds). The logs from two long-liner trips were not used, and one live-bait trip recorded in a very rough manner was not used in the calculations of averages.

We were, however, in a position to request the tonnages unloaded and weighed from the books of the lightering company in charge of operating and maintaining the port. The landings were sorted into yellowfin and skipjack before October 1964; after that date, into yellowfin, bigeye (only those individuals of a weight exceeding 30 kilograms are separated from the yellowfin), and skipjack. Therefore, all bigeye were included with the yellowfin until October, and even then some bigeye weighing less than 30 kilograms were still included with the yellowfin. In general, when the logs were well kept, the captains' estimates of the quantities caught day by day corresponded pretty well with the quantity weighed after landing. Underestimations, which varied according to the captain, were less than 5 percent; but when the logs were in-

completely filled out the underestimations could be larger. In general, the captains only remembered reasonably well the days when fishing was the best. Analysis of incomplete logs caused us certain difficulties, and we were obliged to make estimations. In those cases for which we had the fishing locality, the monthly catches by statistical square were extrapolated in applying the relationship between landings and estimated catches.

The catches in the region under study were greater than the amount of fish landed for these reasons: (a) practically none of the Japanese boats unloaded at Point Noire, (b) some transfer to refrigerator ships took place at sea, and (c) in February-March and in November, when the fleet was fishing in the north, the tuna caught in the study region were unloaded at Abidjan or Dakar. On the other hand, few catches made in other regions were unloaded at Point Noire.

This type of study cannot be complete unless the same work is carried out in all the ports where west African tuna are discharged: Tema, Abidjan, Dakar, and Las Palmas.

Our study only deals with the live-bait fishery. We have data on only one trip by a seiner and two trips by long-liners.

III. PRINCIPAL CHARACTERISTICS OF THE LIVE-BAIT FISHERY IN THE EASTERN TROPICAL ATLANTIC

1. QUANTITIES LANDED - DISTRIBUTION OF THE CATCHES BY SPECIES AND BY NATIONALITIES: In 1963, from September to December, 1,178 tons were landed, the result of 14 trips for which we have only fragmentary information.

In 1964 we have information on 6,875 tons, which is a little more than actually landed because we occasionally obtained information on trips which did not land at Point Noire (table 1).

Table 1 - Tuna Landings at Point Noire, 1964

Species	French			Japanese			Spanish			Total		
	Tons	%	Trips	Tons	%	Trips	Tons	%	Trips	Tons	%	Trips
Yellowfin	5,818.2	98.1	97	339.4	-	5	563.0	-	11	6,720.6	97.8	113
Bigeye	16.7	0.3	97	-	-	-	-	-	11	16.7	0.2	113
Skipjack	94.5	1.6	97	8.4	-	5	34.8	-	11	137.7	2.0	113
Total	5,924.4	86.2	97	347.8	5.1	5	597.8	8.7	11	6,875.0	100.0	113

In the Spanish catches the trip made by the seiner Lerez is included (85.1 tons of yellowfin and 8.3 tons of skipjack in 6 days). Two trips by Japanese long-liners are not included in the table, because that type of fishing is carried out on different stocks (albacore and yellowfin). Since the information we have on these types of fishing is very fragmentary, we have not treated them separately.

Table 1 shows the primary importance of the yellowfin in the catches (98 percent of the total), however that percentage is slightly overestimated because, as we have previously pointed out, some bigeye are included. The skipjack and the large bigeye make up the other 2 percent; those species are little sought after, particularly by the French fishermen, because they are of much less commercial value than the yellowfin.

We may note the importance of the French fishery (86.2 percent of the total). Although our data for the Spanish vessels are correct, the same cannot be said for the Japanese catches. Though the latter are considerably the more important, they transfer their catches directly at sea or land at other ports (Tema and Las Palmas). The Spanish vessels fish by preference from Abidjan, where they have a cold-storage facility. For this reason they do not usually come into the region that we have studied. The landings by the fishermen of those two nationalities (Spanish and Japanese) are too small to consider the differences in the species composition by nationality.

Our studies permit us to sum up the data on the catch of 4,194 tons (or 70 of the 113 trips) landed at Point Noire (table 2).

Table 2 - Landings at Point Noire of 70 of the 113 Tuna Trips Reported in 1964

Species	French Live-Bait		Japanese Live-Bait		Spanish Seiner	Spanish Live-Bait	Total	
	Tons	%	Tons	%	. . . (Tons) . . .		Tons	Trips
Yellowfin	3,747.8	98.5	261.7	-	85.1	25.4	4,120.0	70
Bigeye	18.0	0.5	-	-	-	-	18.0	70
Skipjack	36.3	1.0	10.4	-	8.3	1.0	56.0	70
					93.4	26.4		
Total	3,802.1	90.6	272.1	6.5		119.8 (2.9%)	4,194.0	70

The data from the French vessels proved satisfactory. The distribution of the catches by species is very similar to to that of the overall landings. By nationality the Spanish fishermen are slightly under-represented.

We must admit that our coverage of the landings varied with time. The relation $\frac{\text{Tonnage covered}}{\text{Tonnage landed}}$, very small in January and February, thereafter increased regularly to June, R = $\frac{1}{8}$; July-August, R = $\frac{1}{2.6}$; September-October, R = $\frac{1}{1.5}$; November-December R = 1.

2. CATCH PER UNIT EFFORT BY LIVE-BAIT BOATS: The 70 log sheets for 1964 were grouped by month, assigning each trip to the month in which the mid-point of the trip occurred. Their distribution is condensed in table 3.

Table 3 - Summary of Basic Information Collected from 70 of the 113 Tuna Trips Landed at Point Noire

1964 Month	No. of Trips	Average Length of Trip	Average Catch of Tuna Per Trip	BAIT FISHING Total Catch 1/	BAIT FISHING Total Time Spent Fishing and Steaming 2/	BAIT FISHING Percentage of Total Time at Sea	TUNA FISHING Time Spent by All Trips Total Catch 3/	TUNA FISHING Steaming +Scouting +Fishing 4/	TUNA FISHING Percentage of Total Time at Sea	TUNA FISHING Time Spent only in Tuna Fishing 5/		Total Time at Sea (Bait and Tuna Fishing) by All Trips	Tuna Catch Per Day by All Trips For Total Time at Sea	Tuna Catch Per Day by All Trips Actually Spent Tuna Fishing
		Days	Tons	Tons	Days	%	Tons	Days	%	Days	%	Days	Tons/Day	Tons/Day
January	1	30.0	45.0		0	-	45	30	100.0	25	83	30	1.5	1.8
February	2	27.5	23.5		10	17.5	47	47	82.5	20	35	57	0.8	2.4
June	2	23.5	58.0		1	2.1	116	46	97.9	30	64	47	2.5	3.9
July	3	20.3	83.0		16	22.5	250	55	87.5	22	31	71	3.5	11.7
August	7	18.8	77.4	105 x 70/33	25	18.9	542	107	81.1	53	40	132	4.1	10.4
September	23	21.3	68.0		69	15.4	1,567	380	84.6	269	60	449	3.5	5.8
October	19	19.8	52.3		114	30.3	994	262	69.7	175	46.5	376	2.6	5.7
November	11	21.6	47.0		56	23.5	517	182	76.5	117	64	238	2.2	4.4
December	2	22.0	58.0		7	15.9	116	37	84.1	22	50	44	2.6	5.3
Total	70	20.6	60.0	230.0	298	20.0	4,194	1146	80.0	733	50	1,444	2.9	5.7

1/Not possible to calculate catch by month since only 33 of the 70 trips reported the amount caught. Total bait catch by 33 trips was 105 tons.
2/Time devoted (steaming and fishing) to catching bait.
3/Yellowfin made up 98.5 percent of the catch; balance was bigeye and skipjack.
4/Time spent for steaming, scouting, and fishing for tuna.
5/Time spent actually fishing tuna. But values are overestimated because in some instances information obtained did not separate time spent scouting from time fishing.

The analyses of the monthly data in table 3 leads to some interesting conclusions. The quantities for the months of January, February, June, July, and December are so small that they support only speculation. The data for August, September, October, and November are considerably more significant; the fishing and our coverage were considerably more intensive.

(a) Bait: DIFFICULTIES: Of the 1,444 days at sea for the 70 trips, 298 days (20 percent) were used in bait fishing. The percentage is generally small, but in October, 30.3 percent of the time at sea was devoted to bait fishing. There are two reasons for this: (1) the difficulty of getting suitable bait in the fishing areas themselves; and (2) with the movement of the yellowfin towards the south and the impossibility of getting bait off the Angolan coast, the distance between the fishing areas for bait sardines (Gabon) and tuna (Angola) lengthened and the time spent steaming correspondingly increased. (Only 2 vessels were able to get bait off the Angolan coast.)

This caused the tuna fishing fleet to move northward. In November and December only a few vessels stayed in the region where they could more easily get bait (in November 23.5 percent of the total time at sea was spent bait fishing, and, in December, only 15.9 percent). The difficulties in getting bait seem to limit the development of the fishery and to inhibit the

establishment of continuous exploitation throughout the year. Scarcity of tuna in October cannot be blamed, as we have previously mentioned, for the departure of the fleet during that month.

FISHING AREAS: We have noted 86 bait-fishing areas, which are distributed in the following manner:

Area Description	No. of Times Bait Fishing was Carried On	Season
Ghana - Accra	1	
Annobon	2 (for anchovies)	
Gabon - 0°30' N. - 0°30' S. - Libreville	15	Throughout the year
0°30' S. - 1°30' S. - Cape Lopez	4	
1°30' S. - 2°30' S. - St. Catherine	47	
2°30' S. - 3°30' S. - Nyanga-Mayumba	11	
Congo - 3°30' S. - 4°30' S. - Bas Kouilou	2	August - September - October
4°30' S. - 5°30' S. - Point Noire	2	
Angola - 7°00' S. - 8°00' S. - Ambrizette-Ambriz	2	October - November
Total	86	

Practically all the bait came from off the coast of Gabon (Libreville and expecially St. Catherine), throughout the year. Considering this restricted distribution of bait, the question might be raised if it would not be preferable to use one or two vessels specially equipped for bait fishing, and much less expensive to operate than tuna vessels. The bait would be kept in live-wells at some point on the coast (Port Gentil, for example) where the tuna vessels could load up without losing time. Taking 3.2 tons of bait as the average needed per trip (105 tons recorded for 33 trips), the total fishing for tuna in 1964 required 360 tons of bait for 113 trips. The same extrapolation applied to the time necessary for seeking the bait (298 days x $\frac{113}{70}$ gives an estimate of 480 days (20 percent of the total time at sea). These figures demonstrate that it would be beneficial to improve the operation of the bait fishery. However, it is evident that the proposed organization could not be realized unless a tuna fleet operated throughout the year in the region.

SPECIES FISHED: The great majority consists of "sardine," or "massoundji" (Sardinella aurita) of small size. This is the least common species of Sardinella and schools of young individuals are hard to find. The Japanese fishermen want bait of very small size (less than 12 cm.), whereas the French fishermen use individuals up to 20 cm. Supplements of scad (Trachurus sp. and Decapterus sp.) and mackerel (Scomber japonicus) are also used. The vessels fishing around Annobon have sometimes been able to make up their bait from the schools of anchovy (Enchoviella guineensis) frequently found around the island.

(b) Yellowfin Fishery: The tuna fleet is made up of freezer vessels, with only a few seiners (3 out of 31). We only have information from one seiner trip and have grouped it with the trips of the live-bait vessels for the analysis of the correlation between yellowfin concentration and surface temperature. The differences among the bait boats are not important enough to require grouping those vessels in several classes as to their fishing power.

CAPTURE PER TRIP AND CAPTURE PER DAY AT SEA: On the average a trip lasted 20.4 days, during which 60 tons of tuna were captured. If we follow month by month the average length of each trip (table 3), we notice that it does not vary very much; long trips of more than one month are as rare as those of less than 15 days. In general, the vessels came back even if they were not filled up. This explains the parallel between the catch per day and of the average catch per trip (table 3). Those two indices give month by month the overall yield of the fishery. They increase regularly through August and stay high until September. In October and November the yield falls markedly--52.3 and 47.0 tons per trip (2.6 and 2.2 tons per day at sea). We see here the influence of the disappearance of the bait and of the increase in steaming time between the tuna and bait-fishing grounds. As we will see, it can not be concluded that the cause was a decrease in availability of tuna.

CATCH OF TUNA PER ACTUAL FISHING DAY: The monthly figures in the last column of table 3, as well as the time devoted to fishing, must be qualified somewhat, because some logs were only filled in partially and in generalities. But we note:

(1) The well known influence of the concentration of the vessels gives a double advantage: scouting for concentrations of tuna and for zones where the yield is better is faster (combing effect); and it is possible to keep in contact with the schools, even though certain vessels have to leave the fishing grounds to unload or to catch more bait.

This fishing in a group is really not very well executed, however, because the fishermen are paid on the basis of their boat's catch, and this makes for a keen spirit of competition among the vessels; some of them show a certain reluctance to going out alone scouting. From June to September, with the progressive increase in the number of vessels, the catch per day actually spent fishing for tuna increased regularly. It fell off again in November and December when only a few vessels remained in the region.

(2) The probable disadvantageous localization of scouting in the cold season. The particularly low catches at the beginning of the year may be explained by the fact that scouting and fishing are carried out in warm water where the tuna are unlikely to be found in large concentrations (as we will see a little later).

It would seem that in November this phenomenon may equally explain the low yield (4.4 tons per day of actual tuna fishing). Apparently the fleet did not follow the movement of the large concentrations of tuna towards the South. On reaching the "black" water of the Congo, where the tuna do not come to the surface, the fishermen stopped; only two vessels crossed the "black" water and found to the south of it some regions of strong concentrations.

IV. INFLUENCE OF OCEANOGRAPHIC CONDITIONS ON THE SHIFTING OF THE FISHING GROUNDS

For the last ten years, scientists of the Point Noire Center have been especially interested in the movement of the concentrations of yellowfin and have attempted to relate it to oceanographic conditions. Several cruises by the vessel Ombango, carried out by M. Rossignol, have made it possible to form the hypothesis that large concentrations of yellowfin should occur at the limit of the warm water (27° to 23° C.). Those cruises have shown that the schools of yellowfin follow the seasonal movement of the boundary between cool and warm water.

The oceanography of the surface of the region is well known. Work done by G. R. Berrit makes it possible to locate the extreme limits of the warm water in space and time with enough precision for the needs of the fishermen. Thanks to this information, it has been possible for several years to tell the fishermen the region where the concentrations of yellowfin probably will occur, and to predict their seasonal movements.

Our work on tuna fishing has furnished more precise information on the hydrologic preferences of the yellowfin. The largest concentrations are found in waters of 24°-25° C., which characterize the boundary between the warm and cold water.

(a) FRONTAL ZONE (REVIEW OF BASIC INFORMATION): Schematically, the oceanography of the surface of the Gulf of Guinea can be summed up in this manner: a layer of water called "Guinea Water," which is warm (usually 26° to 30° C.) and of low salinity (less than 34 °/oo) lies over the "Benguela Water," which is cooler (temperature less than 24° C.) and of higher salinity (more than 35 °/oo). In our area, the passage from one water mass to the other is rapid; one finds a gradient of four degrees in a few meters vertically (thermocline) and over a distance of 50 to 100 miles horizontally. We use the name "frontal zone" for the strip of rapid temperature change (an example is shown in fig. 2). The layer of warm Guinea Water, 25 meters thick, is separated from the cooler Benguela Water by a strong thermal gradient.

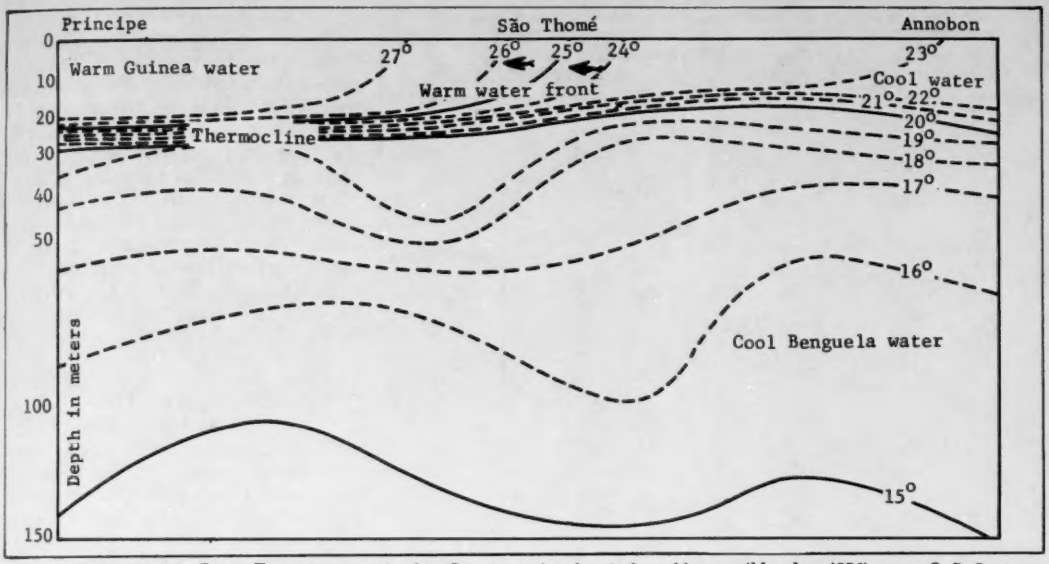

Fig. 2 - Example of the Front: Temperature section from Principe to Annobon in the cold season (May-June 1956), as per G. R. Berrit.

Close to our coast, the frontal zone is distinct. It appears to become less distinct as one goes offshore. In the eastern part of the Gulf of Guinea, the thermocline does not go below a depth of 30 to 35 meters. Towards the west it deepens progressively, reaching 100 to 150 meters near the coasts of the Americas.

In the greater part of the region studied, the temperature changes are accompanied by salinity variations. But in the warm season (November-April), even though the warm water front reaches and passes Loanda in its descent towards the south, one does not pass directly from warm water of low salinity (Guinea Water) to cool saline water (Benguela Water). The salinity gradient is fixed at the latitude of Loanda, although the temperature gradient goes down as far as the latitude of Mossamedes; in that region there is a layer of warm saline water ("Tropical Water").

(b) CORRELATION BETWEEN THE ABUNDANCE OF FISH AND THE TEMPERATURE OF THE SURFACE WATER: Forty-one log sheets show the temperature of the surface water as recorded at the engine intake. Although those temperatures were measured in a crude fashion, the majority of observations show a close correlation between the presence of tuna and the surface temperature. In table 4, we have shown the daily capture of yellowfin as a function of the surface temperature, for all those days when yellowfin were caught. The temperature taken during days when there were no catches are not included in the table.

We may see from table 4:

(1) Little or no fishing in water of temperature below 23° or above 27° C.; only 2 percent of the 206 daily observations exceeded those limits.

(2) The majority (78.6 percent) of the catches and the largest daily yields (or indices of abundance of fish) were obtained in water between 24° and 26° C., characteristic temperatures of the frontal zone.

(a) Average daily catch in water of 24° to 25° C.: 6.3 tons
(b) Average daily catch in water of 25° to 26° C.: 7.7 tons
(c) Average temperature for catches: 24.9° C.

Table 4 - Catch Per Day of Yellowfin as a Function of Surface Temperature

Temperature (°C.)	Relation with Temperature						
	23°-24°	24°-25°	25°-26°	26°-27°	27°-28°	28°-29°	
Tonnage Caught							
0-1	1	9	6	1			
1-2	6	5	3			3	
2-3	2	11	10	2			
3-4	2	5	13	1			
4-5	8	10	8	1			Average
5-6	3	8	6	3	1		temperature
6-7	1	6	5	2			of all
7-8	2	3	4				catches
8-9	1	2	5				24.9°
9-10	1	1		1			
10-11		3	6				
11-12			2				
12-13		4	2				
13-14		2	1				
14-15		1					
15-16		2	4				
16-17		1					
17-18		1	1				
18-19	1	2					
19-20		1*					
20-30		1 1*	2				
30-40			1				
40-50		1*	2				
> 100			1*				
Total	29	77+3*	81+1*	11	1	3	
Percentage	14.1	38.8	39.8	5.3	0.5	1.5	with seiner
Average catch (tons)	5.0	6.3	7.7	4.8	5.5	1.5	without seiner

*Observations from one seiner.

This close correlation between the concentration of yellowfin and the temperature (frontal zone) shown here for surface fish might also exist in the depths. The Japanese long-liners, which we have visited, adjust the depth of their long lines to about 35 meters (the depth of the thermocline) while in our region. Their captures are then made up primarily of yellowfin. These observations, however, are much too few to be studied quantitatively.

(c) CHANGES IN THE FISHING AREA--MIGRATIONS: Our investigations were designed overall to follow (by vessel observations) the changes in the fishing area, and from that to obtain a partial idea of the migrations of yellowfin. The data were grouped by half monthly periods and plotted on a chart of the region, which is divided into statistical squares of 30 minutes on a side. For each fortnight and each square, we summed up: (1) all the daily catches on each log sheet, and (2) the fishing effort (the total days of scouting and fishing in each square by all of the vessels). An average temperature was established for each square. Although the evaluation of the catches is accurate enough (only small underestimations by the skippers affect it), the evaluation of the fishing effort presents many more difficulties and, for that reason, a lack of precision. The log sheets filled in on a daily basis allow scouting and effective fishing to be identified, whereas, the log sheets filled in on an overall or general basis (so many tons in so many days) underestimate the scouting time. Therefore, our data on effort are underestimated, and it is necessary to consider them as more nearly indices of observation density than as precise measures of fishing effort.

Because the temperatures are not precise and the average observations per square are for 15 days, it is impractical to construct a network of isotherms; however, the average position of the front can be fixed. To indicate this, we have plotted the isotherms of 24° and 25° C. We used the results of oceanographic cruises made by the Center during the same periods in previous years for those two-week periods during which we do not have observations.

The 17 charts 3/ show the following facts:

1. As we have pointed out in the analysis of tuna versus temperature, the largest concentrations of yellowfin were found in the frontal zone.

The two charts for the month of June clearly show the distribution of the fish at the beginning of the cold season. The front was situated between Port Gentil and São Thomé. During the first part of June, one boat went south of Point Noire to Benguela, and saw not a single tuna. The temperatures observed during that trip were always 24° C. or below. By the second half of June, the boats, moving considerably to the north, found tuna on the front.

3/Available as an appendix attached to the reprint of this article.

From June to August (cold season), the front was stabilized perpendicular to the coast between Port Gentil and Libreville. The fishing was carried out in that area, principally off Libreville.

At the end of August, the front was beginning to descend to the south and the vessels followed.

In September-October, the process was accelerating. A tongue of warm water was descending along the coast; it reached the Congo at the end of September.

From November to April (warm season), we only have a few observations on the fishery from the Congo to Mossamedes, where the front was then located. In November and December only two vessels went there; they found yellowfin in large concentrations.

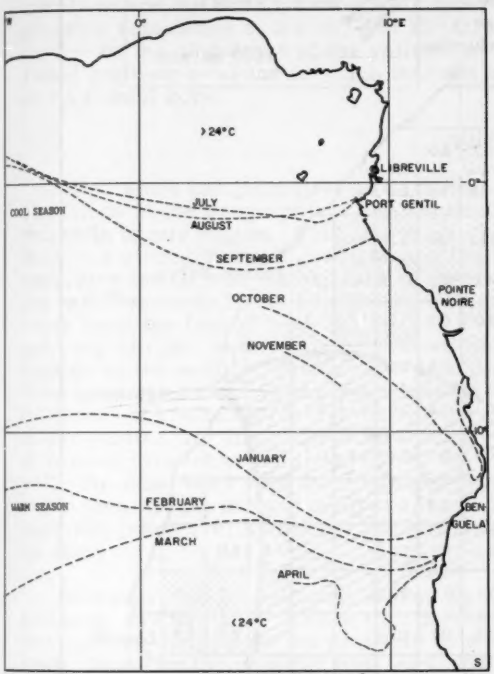

Fig. 3 - Seasonal movement of the front (24° C. isotherm).

The three charts from January 16 to February 29 demonstrate that the fishery was carried on in very warm water (28° C.), and that the overall yield was poor. From January to April the warm water reached its southernmost position (Mossamedes) and spread out farther and farther from the coast to attain a position perpendicular to it. On the other hand, we know that tuna fishing was carried out at Baia Farta (Benguela) from the end of September to March-April. 4/

We have seen that to the south of Loanda a warm, salty water mass (Tropical Water) extends to the cold-water front. It would be interesting to see if the change in salinity of the waters then inhabited by the yellowfin influence their distribution.

In May there were no observations on yellowfin; the front was rapidly returning to its cool season position (Cape Lopez-Annobon).

2. In the warm season, that is to say when the front moved to the South, the island of Annobon was surrounded by warm water (26°-28° C.). Nonetheless, the schools of yellowfin were always seen there and slways caught (charts for January and February-November and December). This phenomenon of a permanent concentration around islands is well known to Pacific fishermen; the Americans call those fish "home guards."

3. Influence of the Congo Waters: We have grouped data relative to the period from 15 September to 31 December on the same chart. This is the period during which the southward moving front crosses the outflow of the Congo. The form and the extent of that outflow have been studied by the Center at Point Noire; its northern limit, in the period of maximum discharge (observations in November-December 1963), narrowly marks the southern limit of the catch of tuna during the same period in 1964. Almost all of the tuna vessels stop there, associating the disappearance of the yellowfin with the appearance of "black" water. Only two live-bait vessels crossed that water; they found the tuna once again when they entered clear water. It seems very probable that the tuna passed underneath the thin layer of "black," low

4/ In a personal communication, F. Correia da Costa has furnished us some information on the live-bait fisheries at Baia Farta. This is carried out by small (10 meters) open boats which make one-day trips on the Continental Shelf. The catches are made up of yellowfin, bigeye, and little tuna. Each boat catches from 250 to 300 tons each season.

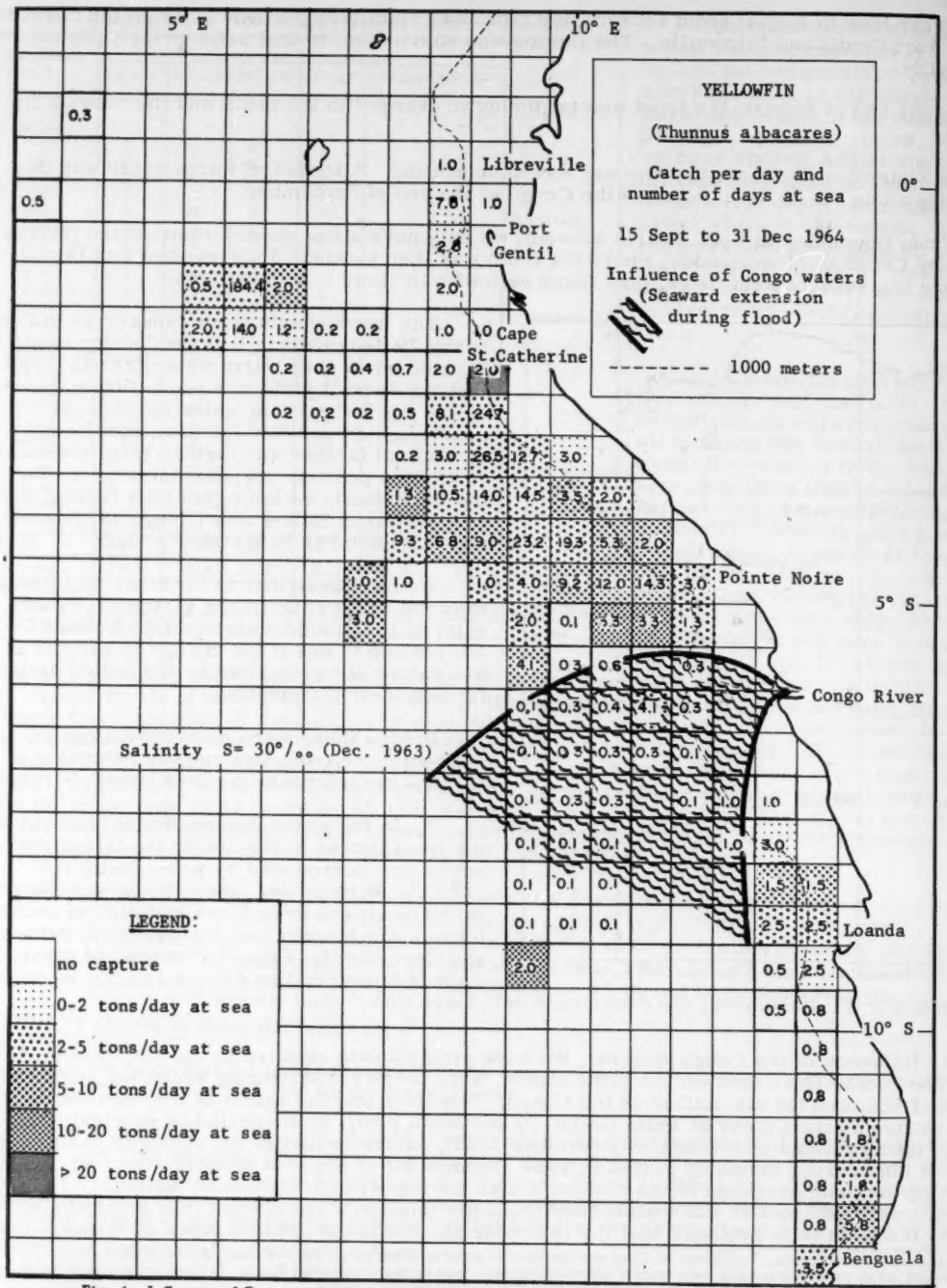

Fig. 4 - Influence of Congo waters is shown in data for September 15-December 31 grouped in this chart.

salinity water. During the second half of November, a French vessel spotted some Japanese long-liners fishing in those waters. Because the layer of "black" water is very thin, it is sometimes possible by chumming to make the tuna come up to the surface and to fish them there by pole-and-line (the fishery around 6°30' S. by 10°30' E. during the second half of November).

4. Optimum Areas for Tuna Concentrations. Judging from the overall picture on the charts, it appears that the yellowfin school more densely in some select areas: (1) around islands (Annobon in particular); and (2) off the Continental headlands at Libreville, Point St. Catherine, Nyanga, Mayumba, Point Noire, Loanda, Port Ambouin, and Benguela. However, the concentrations are not limited to a narrow band parallel to the coast. The French vessels have operated at a distance of about 160-200 miles offshore, but in January-February 1965, some Japanese live-bait vessels were seen 400 miles southwest of Point Noire, approximately where the 24° C. isotherm is located at that time. It remains to be seen if the progressive separation of the 24° and 25° C. isotherms as one goes offshore has a certain influence on the abundance of the yellowfin. In fact, beyond about 100 miles offshore, the horizontal gradient weakens so much that one can no longer define the limit of the warm waters of the frontal zone.

V. CONCLUSIONS

This study has permitted us to demonstrate the enormous role played by oceanographic conditions in the geographical distribution and perhaps the bathymetric distribution of the yellowfin in our region. This fish shows a well defined preference for the zones characterized by a strong thermal gradient (the frontal zone and without doubt the thermocline), which separates the Guinea Water and the Tropical Water from the Benguela Water. Four-fifths of the captures made in 1964 by the French live-bait vessels in the eastern tropical Atlantic came from the frontal zone (24° to 25° C.). These ecological relationships of the yellowfin are very similar to those demonstrated by studies in the Pacific. In the eastern Atlantic, studies on the ecology, stocks, and dynamics of the yellowfin are quite rare and the lack of them becomes more and more evident. To which physico-chemical or biological and feeding (plankton) characteristics this close correlation is due, it is impossible to say at this point in our studies, for the temperature is only an index of a type of water having a whole series of related properties. Furthermore, the ecological laws which regulate the migration of the yellowfin must vary with their age and physiological state (sexual state). This preliminary study does not permit any analysis of this sort; analysis of the average lengths of the fish captured (when available from the logs) has not given any information in relation to time or location.

However, the overall conclusions we have reached should help the fishermen in their scouting. We are able to show that during certain periods of 1964, the activity of the vessels was carried out outside the probable zone of strong concentration. It may be hoped that this study, based on the vessels' own logs, will help them to better localize their activity.

Continuous temperature observations should become a general rule. Using a recording thermometer (such as exists on certain boats), location of the frontal zone is easy in conjunction with the charts of the probable monthly position of the 24° C. isotherm. Zones of rapid temperature change should be scouted.

For several vessels, 1964 was the year of first contact with our region. In spite of imperfect knowledge of the yellowfin and difficulties in capturing bait, the results are encouraging. The catches per day at sea have been comparable with those of the California fishermen on the Pacific coast of America between California and Peru (R. C. Hennemuth 1961).

VI. APPENDIX

The 17 charts mentioned in the article are available as an appendix attached to the reprint of this article. Write for Separate No. 739. There is a chart for each 15-day period showing catch of yellowfin per day and number of days at sea. Covered are the months of January, February, June, July, August, September, October, November, and December 1964.

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READER'S COMMENT

The staff of Commercial Fisheries Review was pleased to read the recent remarks of a Spanish subscriber. In a letter of June 1, 1965, to the Madrid daily newspaper Ya, Gaspar Massó, a member of a Vigo firm said, in part (translated from Spanish):

> ". . .Others may forget the manifold assistance given them for their development, but even though it may not seem of importance to you there are many industrial concerns who are grateful for the . . . instructive and statistical data of exceptional interest. We mention, as an example, the fine work of the Department of the Interior of United States, which through the Bureau of Commercial Fisheries of the Fish and Wildlife Service, distributes. . . its authoritative publication Commercial Fisheries Review with 120-150 pages of excellent text, further supplemented with statistical data by the Market News Service.
>
> "We do not refer precisely to the. . .cost of this publication issued by the aforementioned official agency, but to the incalculable benefits which mean so much to us to have at our disposal such useful material, received by mail with mathematical regularity. . . ."

Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 17--
LONG-LINE GEAR IMPROVEMENT -
ALUMINUM CRIMPING SLEEVE PREVENTS
HOOK DAMAGE BY ELECTROLYSIS:

Extensive hook deterioration and loss caused by electrolysis has plagued swordfish fishing efforts in the new Atlantic Ocean long-line fishery off the east coast of the United States. Copper and zinc-plated copper crimping sleeves have been used to secure hooks to leaders of stainless steel or galvanized wire cable. Contact of the dissimilar metals--zinc, copper and steel--in an electrolyte (sea water) forms a galvanic cell (battery) which produces an electric current. This current electrolyzes (dissolves or corrodes) the eye of the hooks (figure). On one occasion long-line gear with many new hooks was lost and retrieved four days later. Most of the hooks had become badly corroded with the eyes nearly destroyed. Hooks, weakened in this way, frequently result in the loss of hooked fish.

These observations indicated a leader and hook assembly should incorporate a crimping sleeve of a more active metal than copper in order to eliminate electrolytic damage to the hook. An aluminum alloy sleeve was tested by an American fisherman during 1963. After 9 months and 76 long-line sets the test hooks showed only slight deterioration. Only the aluminum sleeves were badly corroded and required replacement. The previous assembly, using a copper sleeve, required hook replacement after about 30 long-line sets.

The substitution of aluminum for copper as a sleeve material has minimized hook deterioration and fish loss, and reduced assembly costs since the cost of aluminum sleeves is approximately 25 percent less than that of copper.

--By Peter C. Wilson, Fishery Biologist (General),
Exploratory Fishing Base,
U. S. Bureau of Commercial Fisheries,
Gloucester, Mass.

The hook on the right is secured to the stainless steel leader with a copper sleeve. Note that the hook has deteriorated from electrolysis. The hook on the left is secured with an aluminum sleeve. Both hooks were used the same length of time in salt water (approximately six weeks).

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 740

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, MAY 1965:

U.S.S.R.: The central Gulf of Alaska became the scene of major Soviet trawling efforts during May 1965. More than 100 Soviet trawlers, 20 reefers, and various support vessels were dispersed generally along the 100-fathom curve from Cape Spencer north and west to Portlock Bank east of Kodiak by the end of the month. A small trawling fleet of about 10 trawlers and 2 reefers continued to fish the area southwest of Cape Ommaney off southeast Alaska, which was heavily worked earlier this year.

Fig. 1 - SRT-R trawler off-loading Pacific ocean perch to a Soviet reefer vessel.

In the western Gulf of Alaska the trawling fleet operating east of the Shumagin Islands was also reduced. Many of the BMRT factory trawlers shifted to the western Aleutians area, leaving a fleet estimated to contain about 12 trawlers, with several reefers and support vessels. The Soviet trawling fleets in the Gulf of Alaska during May appeared to be catching Pacific ocean perch almost entirely.

Fig. 2 - Soviet king crab factoryship.

At least 4 Soviet SRT-M trawlers were fishing for shrimp in the Gulf of Alaska during the month. Most of their fishing was in the Kodiak area until early May when the SRT-M's shifted to the area east of the Shumagin Islands. Observations were that their catches of shrimp were substantial in that region. Three of the SRT-M trawlers, previously associated with shrimp fishing, were seen working among the ocean perch fleets in the central Gulf.

A sizable Soviet trawling fleet developed in the western Aleutians in the general vicinity of Attu Island. About 20 trawlers, including about 10 BMRT factory trawlers, were engaged in the Pacific ocean perch fishery there, which Soviet sources have reported highly successful.

The 3 Soviet king crab factoryships, accompanied by about 9 tangle-net handling SRT trawlers, operated in outer Bristol Bay about 80 miles northwest of Port Moller throughout May.

Soviet whale killer vessels believed to be assigned to the factoryship Aleut were sighted about mid-month near Atka Island in the central Aleutians. Additional whaling fleets were expected, for in past years the Soviets have operated 3 or 4 such fleets off Alaska.

Early in May the Soviet refrigerated fish transport Churkin was granted permission to enter the harbor at Kodiak to deliver a crew member requiring emergency medical treatment. The U. S. boarding party reported the Churkin was equipped to receive fresh fish as well as frozen blocks of fish. The master of the vessel said they were not taking salmon but only small fish and indicated an ocean perch size fish with his hands.

Japan: Three Japanese factoryships were engaged in fish meal and oil production off Alaska during May. The vessels Gyokuei Maru (accompanied by 26 trawlers), Hoyo Maru (with 29 trawlers), and Tenyo Maru (with 10 trawlers) operated in outer Bristol Bay about 80 miles north of Unimak Pass. In addition to meal and oil production, the Tenyo Maru fleet reportedly would fish primarily for Alaska pollock for conversion into minced fish meat (used as an ingredient for fish cakes and fish sausage).

The Japanese shrimp factoryship Einen Maru, with 15 trawlers, remained during May on the proven shrimp fishing grounds about 60

miles northwest of the Pribilof Islands. The second Japanese factoryship (Chichibu Maru) reportedly licensed for shrimp fishing was boarded by a United States party north of the Pribilofs. The Japanese said their main objective this year would be freezing Pacific ocean perch and flatfish. That vessel still has 6 shrimp-peeling machines installed aboard. About mid-month the Chichibu Maru and her 12 trawlers moved to the western Aleutians north of the Rat Islands and were observed fishing perch.

Fig. 3 - Gyokuei Maru, Japanese fish meal factoryship.

King crab fishing by the Japanese factoryships Tokei Maru and Tainichi Maru and 10 tangle-net handling trawlers was concentrated in outer Bristol Bay about 80 miles northwest of Port Moller. The Japanese king crab fleets have often been sighted working the same grounds as their Soviet counterparts.

Fig. 4 - Japanese shrimp factoryship Einen Maru.

At least 4 factory stern trawlers and about 4 smaller side trawlers were believed to be fishing in the western Aleutians area primarily for Pacific ocean perch during May. In the area between Unimak Pass and the Pribilof Islands, 2 other Japanese factory trawlers were operating.

In the Gulf of Alaska, the Japanese factory stern trawler Taiyo Maru No. 82 fished mainly on Portlock Bank east of Kodiak Island, the Daishin Maru No. 12 alternated between Portlock Bank and Albatross Bank off southwest Kodiak, and the Akebono Maru No. 53 worked

Fig. 5 - Japanese crab factoryship Tokei Maru.

between Chirikof Island and the Shumagin Islands southwest of Kodiak.

Long-line fishing by the Japanese continued at a low level during May, with only one small fleet operating off Alaska. That fleet, composed of the fishing-processing vessel Kotoshiro Maru, accompanied by 3 long-liners, was last reported fishing near Semisopochnoi Island in the western Aleutians. So far in 1965,

Fig. 6 - Processing crab meat aboard a Japanese factoryship.

6 Japanese vessels were sighted fishing long lines in the Gulf of Alaska which, as far as is known, are not licensed by the Japanese Fishery Agency to operate in the Gulf area. It is believed those vessels were operating independently rather than belonging to a fleet. Detailed observations of those vessels and U. S. boardings of two of them showed they were taking mainly sablefish. No salmon or halibut were observed aboard the long-liners.

* * * * *

FISHING INDUSTRY MODERNIZATION CONFERENCE PLANNED:

A fishing industry modernization conference to be held in Alaska during summer 1965 has been planned by Alaska's Governor Egan. The prime objective will be to pinpoint areas of needed change and plan pilot projects to

demonstrate new techniques in harvesting and marketing fishery products. The general plan for the conference includes a two-week tour--beginning in late July--of Alaska fishery-producing areas by a special task force of consultants. The task force will include W. S. Miller, an economic development consultant on Governor Egan's staff; the quality control manager for Safeway stores; Dr. Georg Borgstrom, food scientist from Michigan State University; a food-processing engineer from Portland, Oreg., and a representative from the National Canners Association. Two members of the U.S. Bureau of Commercial Fisheries will serve as technical advisors to the conference. Personnel from the Bureau's regional office at Juneau will accompany the task force throughout the tour and also join the group for the final conference in Anchorage.

* * * * *

NEW FLOATING SHRIMP CANNERY:

The vessel Pacific Pearl, converted from the former 175-foot Coast Guard buoy tender Hemlock, left Seattle under tow the latter part of May to operate as a floating shrimp cannery in Kodiak, and replace one lost at Seldovia in the March 1964 earthquake. According to a spokesman for the owners, this is the first vessel of her kind in Alaska.

Engineroom machinery and other gear were removed from the vessel so as to provide maximum working space. It will be able to handle 500 cases (24 cans each) of shrimp an eight-hour shift, and employ 30 to 40 at peak periods. Operations were to shift to king crab in mid-summer. The cost of the conversion was reported to be $350,000.

* * * * *

YUKON RIVER SALMON SMOLT OUTMIGRATION CHRONOLOGY STUDY:

The Branch of River Basin Studies, U.S. Bureau of Sport Fisheries and Wildlife, completed its first month of salmon smolt outmigration sampling in the Yukon River for the 1965 season. Fyke nets, scoop traps, minnow traps, and a tow net took whitefish, burbot, lamprey, and suckers, but no salmon were caught until May 26 when the first chum salmon smolt appeared. The work was conducted in open leads in the river and in open water prior to and during the breakup period.

* * * * *

RED SALMON WORKSHOP HELD:

Fishery scientists from California to Alaska attended the interagency red salmon workshop held for 3 days in Juneau under the sponsorship of the Auke Bay Biological Laboratory, U.S. Bureau of Commercial Fisheries. The workshop brought the scientists up-to-date and defined the current status of red salmon research and problems. Discussions covered all aspects of the red salmon life cycle and included such subjects as basic ecology, physiology, manipulation of the environment, cyclic phenomena, distributions of stocks, and prediction of abundance. Agencies represented at the workshop were the U. S. Bureau of Commercial Fisheries, U. S. Bureau of Sport Fisheries and Wildlife, Alaska Department of Fish and Game, Fisheries Research Institute of the University of Washington, Fisheries Research Board of Canada, Canadian Department of Fisheries, and the International Pacific Salmon Fisheries Commission.

* * * * *

JAPANESE GROUNDFISH CATCHES IN GULF OF ALASKA:

An observer from the Bureau's Auke Bay Biological Laboratory returned to his station after nearly a month's work aboard the Japanese stern trawler Takachiko Maru in the Gulf of Alaska. Principal areas fished by the vessel were Unalaska (248,844 pounds of fish taken) and the Shumagins (30,847 pounds of fish taken). Of 253 hauls, all but 3 were for groundfish. Groundfish hauls averaged about 5.3 metric tons, with the bulk of the catch Pacific ocean perch and sablefish. Another observer completed monitoring of the stern trawler Daishin Maru No. 12 and was scheduled to return to Auke Bay in early June.

* * * * *

KODIAK CRAB TAG RETURNS:

Tag returns from king crabs in the Kodiak Island area were less numerous during May 1965 than during prior months (23 tag returns during May compared to 267 in April). This was expected because fishing intensity decreases during the molting and spawning periods of king crab. Fishing intensity was expected to remain at a low level until about mid-July.

* * * * *

AUKE BAY PINK SHRIMP GROWTH RATE:

Pot fishing for shrimp in Auke Bay was continued through May 1965. Samples showed that Auke Bay pink shrimp (Pandalus borealis) reach a carapace length of 8 to 9 millimeters (0.32 to 0.35 inches) at one year, and 13.5 to 14.5 millimeters (about 0.51 to 0.55 inches) at two years. This early growth rate is comparable with that in lower Kachemak Bay.

* * * * *

NEW PESTICIDES PROGRAM STARTED:

A new pesticides monitoring program was begun in May 1965 as part of the U. S. Bureau of Commercial Fisheries' nationwide program coordinated through the Gulf Breeze Laboratory. Plans were completed for collecting fish from representative areas throughout Alaska. Initially, fish are to be tested for DDT contamination by the Wisconsin Alumni Research Foundation. Later, the Gulf Breeze Laboratory may do the analyses.

Plans were made for cooperative field and laboratory studies by the Bureau's Auke Bay Biological Laboratory and Northern Forest Experiment Station of the U. S. Forest Service to develop biological forest pest controls which are harmless to fish and shellfish. Effects of feeding by juvenile coho salmon and small king crab on spruce budworm larvae infected with Bacillus thuringiensis will be determined in the laboratory.

* * * * *

SOVIET FACTORYSHIP OFF ALASKA VIOLATES U. S.-SOVIET FISHING AGREEMENT:

The U. S. Coast Guard announced in a June 24, 1965, press release that one of its vessels on partol off the Alaskan shore recently discovered Soviet fishing vessels taking king crabs in violation of an agreement signed by the United States and the Soviet Union this year.

The Coast Guard said that its cutter Storis, on patrol off Alaska June 21, saw the Soviet factoryship Konstantin Sukhanov, with 7 fishing boats in the water, taking king crab from 40 fathoms approximately 25 miles south of Unimak Island, Alaska. This is outside the area agreed upon for Soviet king crab fishing in an agreement signed February 5, 1965. The agreement provides for Soviet king crab fishing on the Continental Shelf of the United States in the part of the eastern Bering Sea west of 160° West Longitude. A protest based on the report of the Coast Guard cutter Storis was made on June 24 by the Department of State to the Soviet Embassy in Washington, D. C.

The report of the cutter Storis said that its preliminary attempts to make radio contact with the Soviet factoryship were unsuccessful. Late in the afternoon of June 22 the Konstantin Sukhanov picked up all her catcher boats and proceeded into the Bering Sea through Unimak Pass. The Storis using international signals advised the Soviet vessel that fishing for king crab was only permitted in the eastern Bering Sea. The Konstantin Sukhanov using international signals replied, "fishing for king crabs proceeding in eastern Bering Sea." (U. S. Coast Guard press release, Washington, D. C., June 24, 1965.)

* * * * *

PLANS FOR JOINT JAPANESE-UNITED STATES FIRM TO PROCESS FISH IN ALASKA:

On May 20, 1965, the Governor of Alaska announced that preliminary negotiations had been completed for the joint operation of a fish-processing plant on Prince William Sound by Japanese-United States interests, beginning in the fall of 1965. Involved are a United States fishery firm with headquarters in Seattle, Wash., and two large Japanese firms.

The Governor of Alaska hailed the plan as "a most important milestone in Alaska's economic growth." But he pointed out, "It should be clearly understood that this venture does not mean any lessening of our desire to stop the Japanese from catching our North American salmon on the high seas."

Plans for the joint company were summarized in the Japanese periodical Nihon Keizai on May 22, 1965, as follows:

The joint firm will operate an existing cannery at Orca on Prince William Sound. The Orca cannery is said to have the capacity to produce 200,000 standard cases of salmon during the summer fishing season. The joint company would market its canned salmon pack in the United States, while shipping salmon eggs to Japan. The company might also ship to Japan frozen chum salmon. That species is in demand on the Japanese salt-fish market. In addition, the com-

pany might expand the Orca operation to process crab, herring, and other fishery products. Export sales to Europe have also been mentioned.

The periodical Nihon Keizai in addition reported that, entirely separate from the group involved at Orca, another large Japanese fishing company was working on plans to enter the Alaska canned salmon industry. (United States Embassy, Tokyo, May 27, 1965.)

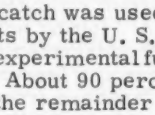
Alaska Fisheries Explorations and Gear Development

LARGE ROCKFISH POTENTIAL SEEN OFF SOUTHEAST ALASKA:

More than 23,000 pounds of rockfish were brought up in a single 1-hour tow during explorations off southeast Alaska in May 1965 by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. The 86-foot vessel was making a survey of trawlable grounds and abundance of bottomfish resources about 30 miles off Prince of Wales Island.

The large rockfish catch was made with a standard commercial-type otter trawl commonly used by West Coast fishermen, but the size of the catch was comparable to the hauls made by the large foreign vessels operating off Alaska's coast.

The entire catch was used for animal feeding experiments by the U. S. Department of Agriculture's experimental fur farm at Petersburg, Alaska. About 90 percent was black rockfish with the remainder mostly Pacific ocean perch and widow rockfish.



American Fisheries Advisory Committee

INTERIOR SECRETARY APPOINTS TWO NEW MEMBERS TO FILL VACANCIES:

The appointment of W. O. Smith, Ketchikan, Alaska, and Clifton D. Day, San Francisco, Calif., to the American Fisheries Advisory Committee, was announced on June 22, 1965, by Secretary of the Interior Stewart L. Udall. The Committee, established in 1955 under provisions of the Saltonstall-Kennedy Act, advises the Secretary of the Interior on general commercial fisheries matters. It is composed of 20 key fishing industry representatives from various sections of the Nation.

Smith has lived in Alaska since the early 1930's, and in Ketchikan since the mid-1940's, where he has been a high-line commercial salmon troller and has represented the salmon trollers in union matters. He was elected to the Alaska Constitutional Convention and served two terms as State Senator from 1959-1965. He replaces Chris Dahl, Petersburg, Alaska, who retired from the Committee after serving since 1955.

Day has been in the fish-canning business for 29 years, and in 1960 was elected Vice President of Alaska Packers Association. He was an advisor to the United States delegation at the second Japan-United States Tuna Conference in Tokyo in 1962, is an advisor to the Pacific Marine Fisheries Commission, and a member of the Fishery Products Committee of the National Canners Association. He replaces Arthur H. Mendonca, also of San Francisco, who retired from the Committee after serving since 1955.

American Samoa

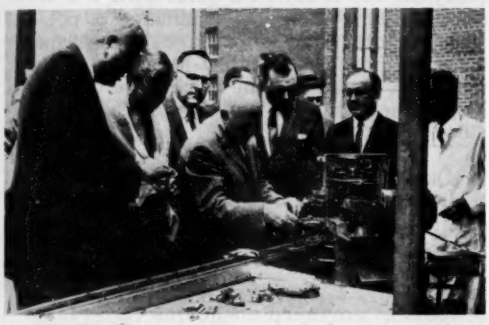
REJECTIONS OF BIG-EYED TUNA DELIVERIES REPORTED HIGH:

Big-eyed tuna deliveries to American Samoa were being rejected at a very high rate in months preceding June 1965, according to the report filed by the Japan Export Trade Promotion Organization's (JETRO) fishery representative in Samoa. In April, one United States packer on that island rejected, in a number of instances, over 50 percent of the quantity processed for packing, and in one instance 100 percent of the processed quantity. The JETRO report attributes this high rate of rejection to stricter inspection standards adopted by the U. S. packing firm. (Suisan Keizai Shimbun, June 3, 1965.)

Blue Crabs

SEMIAUTOMATIC CLEANER-DEBACKER MACHINE DEMONSTRATED:

The operation of a semiautomatic machine for cleaning and debacking blue crabs was demonstrated at Alexandria, Va., in May 1965. It was a special demonstration attended by several members of the House of Representatives Merchant Marine and Fisheries Committee who are from the crab-producing States of Maryland and Virginia.



Operation of new crab cleaning machine being observed by members of the House of Representatives Merchant Marine and Fisheries Committee. Also present are Donald L. McKernan, Director, U.S. Bureau of Commercial Fisheries, and an official of the firm that developed the machine.

The machine, developed under a contract between the Department of the Interior's Bureau of Commercial Fisheries and the American Scientific Corporation, Alexandria, punches through the shell of precooked crabs, exposing a core containing the lump and flake meat. The crab meat is then easily removed from the shell and cartilage. Preliminary tests indicate that the machine eliminates a number of hand-operation steps. It is the first of 4 machines which the Bureau hopes will enable the United States shellfish industry to offset rising labor costs and the loss of skilled labor.

Blue crabs produced along the East and Gulf Coasts now are debacked and cleaned entirely by hand. Development of the new machine is a major breakthrough for the crab industry.

Note: See Commercial Fisheries Review, May 1965 p. 12.

California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 65-A-3-Pelagic Fish (April 19-May 3, 1965): To make an echo-sounder survey of the pelagic species, particularly northern anchovies (Angraulis mordax), Pacific sardines (Sardinops caeruleus), Pacific mackerel (Scomber diego), and jack mackerel (Trachurus symmetricus) was the objective of this cruise by the California Department of Fish and Game research vessel Alaska. The area of investigations was in the waters of southern California from San Diego to Gaviota, extending offshore to Cortes Bank.

This was an experimental cruise to explore a new method of surveying pelagic fish populations. The results obtained with anchovies show this type of survey has excellent possibilities for more comprehensively measuring anchovy density and distribution.

A Precision Depth Recorder (Westrex Mark XV) was operated while the vessel traversed a series of predetermined routes crossing the survey area. The vessel track was plotted every hour and schools detected were recorded on the track. In some areas the same pattern was traversed during both day and night. Schools appearing on the echo-sounder were sampled with a midwater trawl. A Furuno Net-Sonde (Model FNZ-5) wireless depth telemeter was operated with the trawl to obtain fish school depths.

A total of 1,306 miles was traversed on this cruise, and 1,880 schools were detected. Daytime operation accounted for 834 miles and 1,658 schools, while 472 miles and 222 schools were logged at night. The low number of schools recorded at night resulted because the fish scatter and rise to the surface after dark. The resulting echo traces consisted of light scatter with few defined schools.

Northern anchovies accounted for nearly all the fish detected. They were distributed in small schools over a large area of clear blue water south of the northern Channel Islands, and were found almost everywhere in that area out to the offshore limits of the survey (85 miles). Heaviest concentrations were found between San Clemente Island and San Diego, and in the Santa Cruz Basin and Outer Santa Barbara Passage.

Up to 70 schools an hour were detected at a vessel speed of 10 knots. North of the northern Channel Islands and inshore of 50 fathoms, very few schools were present. The Santa Barbara-Port Hueneme area, which is usually the richest in anchovies, was almost completely devoid of fish.

Although it was not possible to measure anchovy school size accurately, the schools were obviously quite small. Visual observation of daytime breezing schools indicated amounts probably not exceeding 1 ton per school. Midwater trawl catches rarely exceeded 100 pounds and echo-sounder traces were much smaller than those recorded on other cruises.

All evidence indicated that the anchovy population was spawning and that the distribution and schooling behavior noted on this cruise are typical during the spawning season. Almost all fish examined were in advanced stages of maturity. Night catches contained numerous running-ripe females which appeared to have been spawning at the time they were caught. In samples which contained spawning fish, 70 to 92 percent of the individuals were males and the smallest ripe female was 113 millimeters (4.4 inches) long. Most fish sampled were adults ranging from 91-165 millimeters (3.6 to 6.5 inches) standard length with a mean of 122 millimeters (4.8 inches). Only 3 percent were smaller than 100 millimeters (3.9 inches).

The schools were distributed between the surface and 40 fathoms, with a great many 10 to 15 fathoms down. Midwater trawl catches consisted primarily of anchovies with occasional individuals of other species, including Pacific hake (Merluccius productus), jack mackerel, lanternfish (family Myctophidae), and squid.

Several night tows were made in one area to check on variability between tows. Those trawls yielded catches of anchovies which varied only slightly in quantity indicating the trawl is fairly reliable for measuring abundance on at least a relative basis.

During the cruise, one gill-net set was made at night in the open sea where anchovies were present. Despite very bad weather, 2 fish were taken. Night light stations in a small area on successive nights produced contrasting results. The first night's work under calm sea conditions was very successful in attracting anchovies. The following night, with a brisk wind and choppy sea prevailing, no fish were attracted.

Sea surface temperatures of 59°-63° F. (15.0°-17.2° C.) prevailed in the survey area. Generally calm weather permitted completion of work scheduled for this cruise.

Note: See Commercial Fisheries Review, July 1965 p. 18.

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Airplane Spotting Flight 65-5-Pelagic Fish (May 13-14, 1965): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Santa Cruz to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game's aircraft Cessna "182" N9042T.

On May 13, the first day of the survey, the area from Ventura to the United States-Mexican Border was scouted. The weather was generally poor, with a low cloud cover which severely hampered fish school spotting. Despite the poor visibility, many schools of northern anchovies (Engraulis mordax) were sighted. The largest schools were seen in the San Diego area.

The area from Santa Cruz Point to Santa Monica was scouted the following day. Scouting conditions were good in the immediate inshore waters, but offshore (beyond about 1 mile) a strong wind roiled the surface and fish spotting was not very successful. Anchovy schools were seen at Cayucos and from Coal Oil Point to Santa Monica. They were small schools and often within the surf line. Red tide was noted that day at Lopez Point, in Santa Monica Bay, and the Huntington Beach and San Diego areas.

Note: See Commercial Fisheries Review, April 1965 p. 16.

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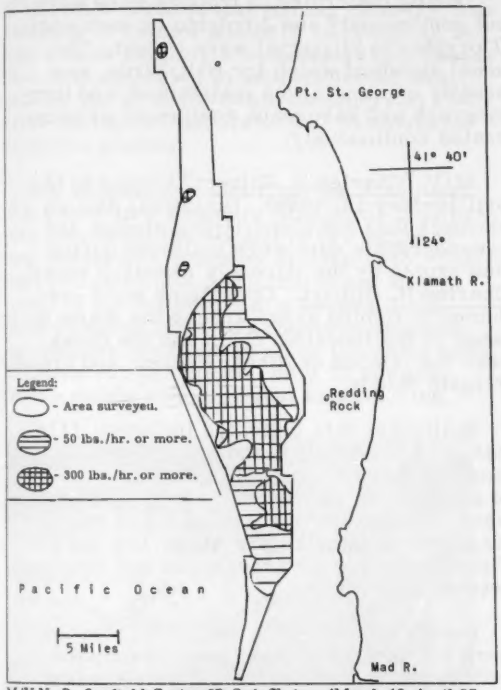
SURVEY OF SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 65-S-1-Shrimp (March 10-April 23, 1965): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in coastal waters from the Oregon border to Eureka, Calif., were to: (1) sample randomly concentrations of ocean shrimp (Pandalus jordani) for determining population estimates and natural mortality rates; (2) determine size, sex, and weight of shrimp; (3) collect stomachs from Pacific hake (Merluccius productus) and arrowtooth

halibut (Atheresthes stomias), and examine them for juvenile shrimp; (4) collect gravid female shrimp for rearing at Menlo Park laboratory; (5) collect cephalopods, rare fish, and invertebrates for special collections and the State Fisheries Laboratory, Terminal Island.

Four tows were made off Bodega Bay in an attempt to catch gravid females for development studies. Not enough egg-bearing females were caught there so about 80 of them were collected off Crescent City and transported to the State's Menlo Park Laboratory by plane.



M/V N. B. Scofield Cruise 65-S-1-Shrimp (March 10-April 25, 1965.)

In all, a total of 127 ten-minute tows were made in an area of 278 square miles from the Oregon border to Mad River, Calif. Towing areas were preselected in accordance with a stratified random sampling program designed by the Biostatistics Section, California Department of Fish and Game. The gear used was a semiballoon, Gulf of Mexico shrimp trawl with 41-foot headrope and 1-inch stretched mesh. A ½-inch stretched-mesh liner was used in the cod end to prevent small 1-year-old shrimp from escaping. Fishing depths during the cruise ranged from 30 to 100 fathoms.

During the cruise it was found that the shrimp bed in one of the areas worked (Area A) where 50 pounds or more an hour could be taken involved some 152 square miles, and contained an estimated 4 million pounds of shrimp. Commercial concentrations, yielding 300 pounds or more an hour, were found over an area of about 88 square miles. The average catch per hour on this cruise was 366 pounds and ranged from 36 to 1,380 pounds.

The count of shrimp (heads on) per pound ranged from 54 to 262, with a mean of 183. About 28 percent of the females caught were carrying eggs. A few gravid 1-year-old females were observed.

In most cases, fish catches on this cruise were small, with several tows yielding large concentrations of whitebait (Allosmerous elongatus).

A few unusual cephalopods collected on the cruise were sent to the California State Fisheries Laboratory for identification. A total of 101 Pacific hake and arrowtooth halibut stomachs was collected and preserved for examination in the laboratory. Also, several species of flatfish were collected by personnel from the University of California's Institute of Marine Resources for pesticide residue studies.

Note: See Commercial Fisheries Review, April 1965 p. 17.

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MARINE SPORT FISH SURVEY OFF SOUTHERN CALIFORNIA:

Airplane Survey Flight 65-4 (April 23, 1965): This one-day survey was the first of a series of flights to count the number of poles being fished from the shoreline by sport fishermen, and also count the number of persons attending them, if possible. For this purpose, the southern California coastline between Jalama Beach and the Mexican Border was surveyed from the air by the aircraft Cessna "182" N9042T of the California Department of Fish and Game. The counts made will eventually be used to determine shore-fishing effort in southern California.

The weather was clear and visibility was good throughout the flight. The shoreline between Los Angeles harbor and Jalama Beach was covered earlier in the day. In the afternoon the coastline between Long Beach and the United States-Mexican Boundary was surveyed. The result of the survey was a

count of 64 fishing poles attended by some 54 persons.

Cans--Shipments for Fishery Products, January-March 1965

A total of 592,020 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-March 1965 as compared with 571,307 base boxes used during the same period in 1964.

Larger shipments to the Pacific area accounted for the increase in 1965. The gain was partly offset by lower shipments to the East and South. Following are regional shipments in the first quarter of 1965 and 1964 (reported in base boxes of steel consumed to make cans):

Receiving Area	Jan.-Mar.	
	1965	1964
West	414,000	360,000
East	161,000	187,000
Southern	17,000	24,000
North Central	1/	1/

1/Less than 500.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.

Central Pacific Fisheries Investigations

SKIPJACK TUNA
BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 80 (April 5-12, 1965): To collect various biological data and live tuna and mackerel-like species for behavior studies were the objectives of this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The areas of operation were south of Oahu between Kaena Point and Penguin Bank, and not more than 20 miles from shore.

The results of the cruise included the return to the Honolulu Biological Laboratory's Kewalo Basin facility of 64 live skipjack tuna (aku), 3 yellowfin, and 1 little tuna.

During the cruise, 2 trolling lines were out continuously and 2 dolphin or mahimahi (Coryphaena hippurus) were caught. The usual standard watch for fish, birds, and aquatic mammals was maintained, and thermograph and barograph equipment were operated continuously.

M/V "Charles H. Gilbert" Cruise 81 (April 19-May 13, 1965): Biological data on skipjack tuna for blood-typing studies and oceanographic data were collected during this cruise by the Bureau's research vessel Charles H. Gilbert. Operations were conducted in fishing areas around the major islands of the Hawaiian chain and the banks near the islands of Nihoa, Necker, and French Frigate Shoals.

Biological data collected included: (1) a total of 2,195 whole blood and 387 serum samples taken from 15 skipjack tuna schools. In addition, 78 yellowfin whole blood samples were collected. (2) A total of 1,926 skipjack tuna were sampled for blood and serum. Those fish were also measured and their sex determined.

During the cruise, a total of 68 bird flocks were sighted; 29 of them were associated with skipjack tuna schools, 1 with 2 yellowfin schools, 2 mixed schools, and 2 with schools of porpoises. The remaining 34 were unassociated with a particular type of fish school.

A total of 19 yellowfin and 22 little tuna were brought back from Pengiun Banks and Keahole Point, Hawaii, for study under the Bureau's Behavior Program in the bait tanks of the vessel. Tuna-like fish from stomach contents of yellowfin tuna caught off Lanai and samples of bait fish taken off Hanalei Bay, Kauai and French Frigate Shoals were preserved for further study.

Oceanographic operations during the cruise included taking the usual series of bathythermograms, sea surface and temperature samples, and the release of 620 drift cards.

Note: See Commercial Fisheries Review, June 1965 p. 17.

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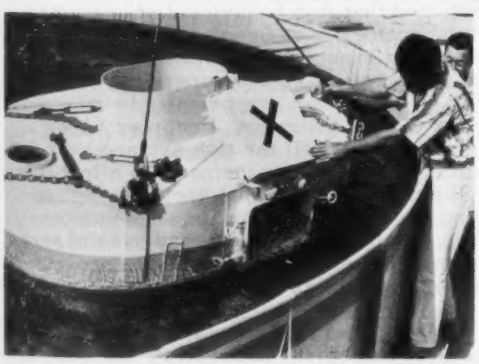
SKIPJACK TUNA APPEAR
IN LARGE NUMBERS
AROUND HAWAIIAN ISLANDS:

The valuable skipjack tuna (aku), mainstay of Hawaii's commercial fishing industry, was available in record numbers in Hawaiian Island waters starting about May 1965. These have been collected in unprecedented numbers by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu for scientific studies.

The research vessel Charles H. Gilbert of the Bureau's Honolulu Biological Laboratory completed the second of two skipjack tuna research cruises as of June 1965. The first cruise in late April and early May resulted in the collection of a record 2,195 blood samples from 15 schools of skipjack. By contrast, a cruise in much the same area 2 months earlier yielded only 70 samples from a single school of that tuna species.



Portable tank used to transfer skipjack tuna from vessel to plastic pool at Bureau's Biological Laboratory, Honolulu.

As of early June, the Charles H. Gilbert returned from the second research cruise during which 184 live skipjack tuna were caught--another record. The vessel also caught 3 little tuna (kawakawa) and 2 yellowfin tuna. Those fish were returned to the Kewalo Basin facility of the Honolulu Biological Laboratory. They were handled according to skillful techniques developed by Bureau personnel of the Laboratory, the only institution in the world which has been able to keep captive skipjack tuna alive for long periods.

In addition to collecting blood samples, scientists on the research vessel's first cruise took specimens from each school of fish. As is well known to skipjack tuna fishermen, single schools are usually composed of fish of almost identical size. This held true of the specimens collected by the Bureau's research vessel--those from the same school were of the same size.

The blood samples are used in a study of subpopulations of skipjack tuna. Subpopulations are reproductively isolated groups. Many such subpopulations go together to make up the whole population of skipjack in the Pacific Ocean, much the same as populations of the various nations go to make up the whole world population.

The fish taken on the vessel's second cruise are being used primarily for behavior studies at the Laboratory's Kewalo Basin tank complex. Scientists there are studying how well skipjack tuna see and hear, and testing their ability of smell. Other species of fish, notably salmon, have been shown to have acute olfactory senses. Salmon can recognize odors in fantastically low concentrations--one part in 80 billion, or about like a dash of bitters in a swimming pool.

Twenty of the skipjack caught were shipped immediately to Sea Life Park, where they were placed in the large reef tank. Scientists of the U. S. Bureau of Commercial Fisheries will be interested to see if they grow more rapidly or behave differently there than in the smaller plastic swimming pools used at the Bureau's Kewalo Basin facility.

Note: See Commercial Fisheries Review, July 1965, p. 20.

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TRANSPORT TECHNIQUES
FOR LIVE TUNA
AIDS BEHAVIOR STUDIES:

Although fishery scientists know a great deal about how fish behave, much of that knowledge rests on experiments conducted with species that have little or no commercial value, with the notable exception of the salmon. The classical experiments in fish behavior have been performed largely on such small fish as the three-spined stickleback. The results, although fascinating and

often extremely valuable in terms of what they disclose about an important element of the animal kingdom, are often not immediately applicable to commercial fisheries.

One difficulty that has beset efforts to conduct systematic experimental studies of the food fish of the open sea, such as the tunas which are the basis of a major United States industry, has been that of maintaining those relatively large and speedy fish in captivity. This difficulty has been solved at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Several times a year the Laboratory's research vessel Charles H. Gilbert noses alongside the dock in Kewalo Basin in Honolulu carrying on her crowded deck a cargo of what look like oversized bathtubs with lids on them. Each contains 5 to 10 live tuna caught only a few hours previously by the vessel's crew of expert fishermen. The fish are caught on a barbless hook. The fisherman swings them over an opening in the lid of the container. Another person steadies the line as the fish is lowered into the container. When tension on the line is relaxed the fish swims free.

The arrival of the Bureau's research vessel is the signal for a crane operator to stand by. Working rapidly, Bureau fishery scientists fit a bridle to the "bathtub" tanks. One at a time, they are lifted from the deck and taken a few yards away to the six 24-foot plastic swimming pools that are part of the Laboratory's complex for fish behavioral research. There the lids are unbolted from the containers. The crane lifts and then lowers the tanks into the sea water-filled swimming pools. Fishery scientists carefully tip them to let their valuable cargo of living tuna swim free.

From the time of catching until they are freed in the pool, the tuna have never been touched. They have spent only a few seconds in the air as they are swung from the sea surface to the tanks. Such methods have had impressive results. The Laboratory's Kewalo Basin facility often has as many as 60 or more tuna waiting their turn for behavior studies. As a result, the Bureau's Honolulu Biological Laboratory has become the only one in the world where live tuna are routinely collected for study. The procedure for handling the fish was worked out by a biologist who has been a member of the Laboratory staff since 1956.

One of the plastic pools used by the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, to keep skipjack tuna alive for behavior studies.

Earlier methods of collecting the fish called for storing them in the vessel's baitwell and then transferring them by hand to the experimental tanks. The fish quickly died. The laboratory biologists then designed and had large iron tanks built. Those proved much more promising, but they were heavy and rusted badly. Reinforced plastic for the lightweight tanks is now used. The plastic has many advantages. Among them is the fact that being translucent, it allows the fish to see where it is going. It is much easier to handle the lighter plastic tanks than the heavy iron tanks.

It is only since methods of handling were perfected that fish behavioral scientists in the laboratory have been able to conduct controlled experiments with tuna. Already about a dozen scientific papers have emerged, each of them revealing previously unknown facets of tuna behavior. Under way are studies of how well the fish see and hear and smell, how they keep themselves afloat (tuna would sink if they did not keep moving constantly), what their reaction is to various kinds of food. From the broad base of such information may come new and improved methods of catching tuna.

One of the achievements of the Bureau's Honolulu Biological Laboratory has been its ability to keep skipjack tuna alive for several months. The skipjack, possibly the last great latent tuna resource, is the mainstay of the Hawaiian commercial fishery and is caught in large quantities off the coasts of Japan, and of Mexico and Central America. It has proven to be one of the most difficult fish species to maintain. Skipjack tuna are now kept alive as long as 6 months in the Laboratory's tanks.

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SPECIALLY DESIGNED SONAR SYSTEM FOR LOCATING SUBSURFACE TUNA:

Ocean research scientists are turning to a new and powerful tool in their search for what has been called the last great latent tuna resource of the Pacific Ocean--the subsurface tuna. A specially designed frequency-modulated sonar system is being built in California which will be installed on the research vessel Townsend Cromwell of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, in spring 1966. Its installation will allow scientists to observe the behavior of tuna "in their natural element, the sea, and give us insight into methods of capture that do not rely on observing surface tuna schools," according to the Bureau Area Director at Honolulu.

Sonar, as its name implies, uses sound for exploration of the undersea world. Sound emitted by the device is reflected by solid objects. The users can then plot the direction and distance of the objects from the vessel. Bureau scientists at the Honolulu Biological Laboratory say that their sonar will have a range of almost a mile. At 100 yards it will enable them to distinguish between fish no farther apart than 7 inches.

The Laboratory's chief interest, however, is not in individual fish, but in schools of fish. The sonar will permit scientists to follow a school as it swims out of sight beneath the surface of the sea. Previous research has suggested that they will be able to distinguish between schools of different kinds of fish, since each species may offer a typical "signature" on the sonar.

That the tuna range throughout the Pacific Ocean is well known, but schools are rarely seen at the surface except fairly near land. That they also spend a part of their lives in the ocean depth is proved by long-line catches (which include big tuna, particularly big-eyed and yellowfin) several hundred feet below the surface.

Of particular interest to the scientists of the Honolulu Biological Laboratory are the skipjack tuna. That tuna species forms the mainstay of the Hawaiian fishing industry. Skipjack are also caught as small fish off the west coast of the tropical Americas. There is evidence that some fish migrate from the eastern Pacific to the central Pacific. But skipjack schools have not been sighted in the area between the eastern and central Pacific; they are not seen until some of them are caught in the fishery off the Hawaiian Islands.

Results of the sonar studies are expected to be useful in the design of new types of fishing gear designed to harvest the subsurface tuna.

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OBSERVATIONS ON TUNA RESEARCH:

The following observations were recently made by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, based on its tuna research program:

Albacore Tuna Ecology: Catch rates in terms of numbers of South Pacific albacore tuna caught per 100 hooks did not show any marked trend during 1963 and 1964. On the other hand, the same data, converted into catch in weight per 100 hooks, showed a significant decrease in 1964 when compared to 1963. This was due to a decrease in mean size of fish taken in the fishery. More significant, perhaps, was the decrease in catch per day's fishing (as expressed in weights) in 1963 and 1964 as compared to earlier years (1959-62). There is evidence that this fishery has followed a "normal" course of development, from that of exploiting a relarively virgin stock in which a surplus of older, larger fish had accumulated over the years, to the present stage in which somewhat lower catch rates are obtained because of the earlier removal of the "surplus" fish. Some comparative size data indicate that there were more of the larger fish taken in earlier years.

Tuna Behavior: Visual acuity experiments were conducted with a 5-pound yellowfin tuna. Results coincided with those for a 9-pound yellowfin, although variation in visual acuity with size of fish had been expected.

Working with a 50-centimeter (19.7 inches) yellowfin, a hearing curve for frequencies was obtained ranging between 40 and 1,000 cycles per second. The lower limit was imposed by the instrument used. The upper limit was selected arbitrarily.

On the basis of present knowledge, yellowfin tuna, like other fish, hear best in the frequency range of 300 to 500 cycles per second, and the experiment made bore this out. Sounds within that frequency range occur in the sea. An example is the sound made by swimming

anchovy. The response of tuna to that sound (recorded) will be tested at sea during the summer.

Twice the hydrophone picked up a distinct "snap" sound just as the yellowfin engulfed a piece of food. This was the first time a tuna was heard making a sound other than the splashing that occurs when they break through the surface of the water.

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TRADE WIND ZONE
OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 15 (April 7-30, 1965): The flow pattern for the area investigated during this cruise in the central North Pacific by the research vessel Townsend Cromwell showed changes similar to those observed during a cruise (April 12-May 4, 1964) the year previous. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, on April 30 completed the 14th in a series of oceanographic cruises to determine the rate of change in the distribution of properties in the trade wind zone of the central North Pacific. The area of operations was bounded by latitide 10° N., 27° N. and longitude 148° W., 158° W.

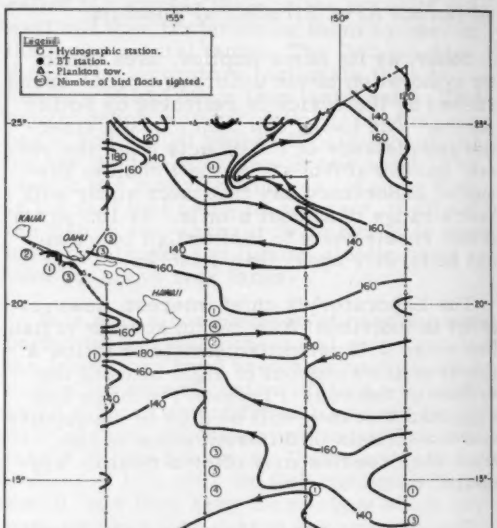
During this cruise it was observed that while the intensity of the westerly flow south of 20° N. was nearly the same as in March 1965, the transport was greater with an overall increase in the depth of the 20° isotherm of about 20 meters (78.7 feet). The flow south of 20° N. had changed from the usual southwesterly to an almost northwesterly set. The random flow to the north of 20° N. was similar to that in March with the large anticlockwise eddy still centered around the same station.

The increase in temperature south of 16° N. which was observed during March 1965 appeared to have ceased with maximum temperatures at slightly over 26° C. (78.8° F.). North of 20° N., cooling had ceased and a rise of nearly 1° C. (1.8° F.) in the minimum temperature occurred.

The samples run at sea showed an increase in salinity in the southern region which may reflect the flushing of the low salinity water present in the months previous to this cruise. The high salinity water of the north had retreated even farther north than had previously been observed.

A total of 43 oceanographic stations was occupied along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). Deep casts to 4,000 meters (13,123 feet) were taken at two stations, and a cast to 5,000 meters (16,404 feet) was taken at one station.

A small increase in the number of bird flocks was observed during the April cruise, with 50 flocks in the regular cruise area compared to 43 during March 1965, and 16 in April 1964. Most of the flocks were distributed evenly over the southwest half of the cruise pattern.



Track chart of the research vessel Townsend Cromwell Cruise 15 (April 7-30, 1965), showing depth contours of the 20° C. isotherm in meters.

Other operations during the cruise included taking the usual series of bathythermograms, sea surface temperatures (including the use of a Hytech salinity-temperature-depth in situ recorder), release of drift bottles, and collection of other oceanographic data.

Note: See Commercial Fisheries Review, July 1965 p. 20, August 1964 p. 17.

Clams

CERTAIN POTOMAC RIVER AREAS CLOSED TO SOFT-SHELL HARVESTING:

By an order effective June 19, 1965, the Potomac River Fisheries Commission prohibited soft-shell clam operations in Areas A, C, E, G, J, M, and P of the Potomac. (In addition, soft-shell clam dredging is not allowed upriver above the Charles County-St. Mary's County line.)

Note: For a description of the specified closed areas write to: Potomac River Fisheries Commission, P.O. Box 128, Colonial Beach, Va. 22443.

Columbia River

CLOSURE OF SUMMER SALMON SEASON:

At a public hearing held in Portland, Ore., June 14, 1965, the Washington State Department of Fisheries and the Oregon Fish Commission jointly closed the summer commercial salmon season on the Columbia River until July 29, 1965. Sport fishing for salmon on the Columbia was also closed from June 21 to July 29 by the Washington Fisheries Director. The Oregon Game Commission was expected to take comparable action. (The closures did not affect the shad commercial fishery below Bonneville Dam which was allowed to continue in certain areas from June 16 through July 3.)

Fisheries agencies in Washington and Oregon are concerned about the poor summer runs of chinook and sockeye salmon in the Columbia. Fisheries biologists of both States estimate the total summer runs of the two salmon species will not exceed the bare minimum of 80,000 to 90,000 of each species needed to perpetuate the runs.

Concern was expressed that commercial landings from the Indian gill-net fishery above Bonneville Dam might reduce the salmon runs below the numbers desired for spawning escapement.

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FEDERAL FUNDS ALLOCATED TO REPAIR FLOOD DAMAGE TO FISHERY FACILITIES:

Under the Columbia River Fishery Development Program, Federal and State agencies in Washington, Idaho, and Oregon are sharing about $996,000 in Federal funds to repair and replace fishery facilities damaged by floods in late 1964 and early 1965. The money is being used to clear the rivers in the Columbia Basin of log jams, remove debris from streams and tributaries, repair damaged fish hatcheries and fish ladders, and replace or repair broken fish screens.

Washington State's $96,000 allotment includes funds for stream clearance and repairs to five fish hatcheries.

The Idaho Department of Fish and Game is receiving $365,000 for stream improvement. The Agency is using the money to remove and clear debris caused by a large log jam on the Salmon River, replace roadways and cofferdams, and repair cave-ins on the Selway Falls fish ladder.

In Oregon, of the $535,000 total fund, $63,500 is allocated to the Oregon Fish Commission for rehabilitation of 5 fish hatcheries, plus $110,000 for stream clearance. The Oregon Game Commission is receiving $61,000 for repair and replacement of approximately 50 screens in the John Day area and 10 in the Walla Walla area. The U. S. Bureau of Commercial Fisheries will use $300,500 of the Oregon allotment to repair Federal installations--Eagle Creek, Little White Salmon, and Willard National Fish hatcheries.

The Eagle Creek National Fish Hatchery and the Cascade Salmon Hatchery were made completely inoperable by the flood. Prompt action by the crews of both stations, who worked on a 24-hour basis using pumps and other temporary aids which they devised, were able to save millions of fish from complete destruction. Emergency pumps were installed and both stations were returned to full capacity within 30 days.

Note: See Commercial Fisheries Review, March 1965 p. 28.

Consumption

U. S. PER CAPITA CONSUMPTION FOR FISHERY PRODUCTS, 1947-65:

The U. S. civilian per capita consumption of fishery products remained unchanged in 1964 at 10.6 pounds (edible weight), the same as in the previous two years. From 1963 to 1964, consumption of fresh and frozen fishery products increased slightly while that for

United States Civilian Per Capita Consumption of Fishery Products (Edible Weight), Selected Years, 1947-65

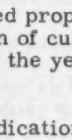
Type	Preliminary Indications for 1965	1/ 1964	1963	1962	Average 1957-59	Average 1947-49
	(Pounds)					
Fish (edible weight) - Total	10.7	10.6	10.6	10.6	10.5	10.7
Fresh and frozen	3/	5.9	5.7	5.8	5.7	5.9
Canned 2/	3/	4.2	4.4	4.3	4.2	4.2
Cured	3/	.5	.5	.5	.6	.6

1/Preliminary.
2/Excludes canned food products containing small quantities of fish, such as clam chowder.
3/Not available.

canned fish dropped proportionally. The per capita consumption of cured fishery products was unchanged for the years 1962 through 1964.

Preliminary indications for 1965 are that per capita consumption will increase slightly. (National Food Situation, NFS-112, May 1965, U. S. Department of Agriculture.)

Note: See Commercial Fisheries Review, January 1965 p. 25.



Federal Aid for Sport Fish and Wildlife Restoration

INTERIOR APPORTIONS FUNDS TO STATES FOR FY 1966:

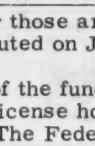
Distribution of $15 million in Federal-aid funds for fish and wildlife restoration projects was made to the 50 states on July 1, 1965, announced Secretary of the Interior Stewart L. Udall. This was an increase of $800,000 over a similar distribution a year earlier.

Of the $15 million allocated, $12 million is for wildlife restoration and $3 million is for sport fishery projects. An additional apportionment for fish and wildlife projects will be made in the fall of 1965. The apportionments made in July will enable states with small reserve funds to finance their Federal-aid operations from July 1 until the final apportionment for the year is made in the fall.

Fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment. Under the Federal-aid programs, states spend their own funds on approved projects and are then reimbursed for up to 75 percent of the cost. The laws establishing those programs also provide $10,000 each for Guam, the Commonwealth of Puerto Rico, and the Virgin Islands. The total 1966 fiscal year apportionments for those areas are included in the funds distributed on July 1.

Distribution of the funds is based on the number of paid license holders in a state and the state area. The Federal aid in Fish and Wildlife Restoration programs are administered by Interior's Bureau of Sport Fisheries and Wildlife.

Note: See Commercial Fisheries Review, August 1964 p. 20



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1965:

Fresh and Frozen: Purchases of fresh and frozen fishery products in April 1965 for the use of the Armed Forces were down 11 percent in quantity and 21 percent in value from the previous month. The drop was due mainly to smaller purchases of such high-priced items as shrimp, scallops, and oysters.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1965	1964	1965	1964	1965	1964	1965	1964
(1,000 Lbs.)				($1,000)			
2,029	1,734	8,707	8,524	1,225	903	5,551	4,458

Compared with the same month in 1964, purchases in April 1965 were up 17 percent in quantity and 36 percent in value. Average prices for shrimp, scallops, and Pacific oysters were much higher in April 1965. Purchases in April 1965 were up for shrimp, flounder fillets, ocean perch fillets, and haddock fillets and portions. But purchases were down for scallops and halibut steaks.

Total purchases in January-April 1965 were up 2 percent in quantity and 24 percent in value from those in the same period of 1964. The increase in value was due almost

Table 2 - Principal Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

Product	April				Jan.-Apr.	
	1965		1964		1965	1964
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Quantity
	Pounds	Cents/Pound	Pounds	Cents/Pound	(Pounds)	
Shrimp:						
raw headless	109,000	99	132,600	82	385,800	414,650
peeled and deveined	89,500	143	44,986	108	409,160	276,208
breaded	297,600	86	322,000	67	1,227,520	1,301,200
molded and breaded	77,650	66	37,900	58	233,550	152,900
Total shrimp	573,750	95	537,486	73	2,256,030	2,144,958
Scallops	90,900	76	219,350	52	629,784	910,350
Oysters:						
Eastern	39,120	99	24,502	99	246,610	351,420
Pacific	14,912	81	19,314	52	112,564	93,120
Total oysters	54,032	94	43,816	78	359,174	444,540
Fillets:						
Cod	32,000	34	45,520	30	188,270	172,766
Flounder	246,700	39	141,000	31	1,049,200	1,314,816
Ocean perch	362,250	30	236,100	30	1,370,540	1,247,220
Haddock	138,000	33	99,530	29	593,550	668,774
Haddock portions	177,000	44	-	-	675,054	8,650
Steaks:						
Halibut	52,800	50	116,770	35	375,220	423,795
Salmon	10,960	69	15,675	68	43,700	64,977
Swordfish	500	56	700	51	1,760	6,010

entirely to the higher prices prevailing in 1965. A sharp increase in purchases of haddock portions was almost offset by smaller purchases of scallops, eastern oysters, flounder fillets, haddock fillets, and halibut steaks.

Canned: Purchases of canned tuna and canned sardines for the Armed Forces in January-April 1965 were running considerably ahead of the same period in 1964. Purchases of canned salmon were light in early 1965. (Most canned salmon purchases for the Armed Forces are made in the fall months after the main canning season ends.)

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1965	1964	1965	1964	1965	1964	1965	1964
	(1,000 Lbs.)				($1,000)			
Tuna	315	2	2,504	1,459	142	1	1,083	645
Salmon	1	-	9	679	1	-	8	416
Sardine	70	28	216	107	21	11	110	41

Freeze-Dried: Purchases for the Armed Forces in April 1965 included 2,103 pounds of freeze-dried shrimp priced at about $12 a pound.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, June 1965 p. 19.

* * * * *

PALLETIZED UNIT LOADS FOR CANNED TUNA PURCHASES BY THE DEFENSE DEPARTMENT TO BE REQUIRED ON TEST BASIS:

The military services have expressed a strong desire to receive subsistence items in palletized loads whenever possible and practical. As a result, the Defense Subsistence Supply Center announced May 20, 1965, in Headquarters Notice to the Trade No. 54 (65) that a number of items have been selected to be palletized by suppliers on a test basis. Canned tuna is included in the test. Requests for bids on selected quantities of canned tuna will specify the need for palletization.

Palletized unit loads of canned tuna will require full 4-way entry, wing type, 40 inch by 48 inch, seasoned wood pallets. Top and bottom of shipping cases will be glued to each other and to pallets by two narrow strips of glue on each case. The palletized unit load is limited to the overall maximum dimensions of 43 inches in length, 52 inches in width, and 54 inches in height, and to a maximum weight of 2,100 pounds.

The following Military Specifications will be referenced in purchase documents for canned tuna when palletization is required:

(a) MIL-L-0035078A, Loads, Unit: Preparation of Non-Perishable Subsistence In

(b) MIL-P-15011E, Pallets, Material Handling, Hardwood, Post Construction, 4-way

(c) MIL-A-13374B, Adhesive Dextrin

(d) MIL-STD-731, Quality of Wood Members for Containers and Pallets

(e) FF-N-105A - Nails, Wire, Brads, and Staples

Additional information will be available from Regional Offices of the Defense Subsistence Supply Center.

Fish Meal

COMPACT PROCESSING PLANT BUILT BY NORWEGIANS:

Fish meal processors in the United States have shown considerable interest in a compact fish-meal processing plant built in Norway and sold in this country through a New York firm. The Norwegian manufacturers feel there is a ready market for this equipment in the United States.

The Norwegian-built plant has a fish meal production capacity ranging from 10 to 60 tons every 24 hours, and comes in three sizes, each of which is adaptable to ship or shore installation. The plant's operation is essentially the same as that of a menhaden reduction plant. It is possible to add equipment to add the stickwater concentrate into the press cake as it is being dried, thereby utilizing all of the product.

△△△△△△△

Fish Protein Concentrate

NEW MODEL-SCALE SOLVENT-EXTRACTION PROCESSING UNIT IN OPERATION:

The accelerated Fish Protein Concentrate program of the U. S. Bureau of Commercial Fisheries took another major movement forward in May 1965 when the new model-scale unit for the study of chemical fish protein concentrate-processing methods went into operation. Designed and constructed by the engineering staff of the Battelle Memorial Institute under a Bureau contract, the unit was installed in leased facilities completed about that time at Beltsville, Md., near the Bureau's College Park Technological Laboratory.

The new unit is extremely flexible in that it will permit engineering studies on solvent-extraction procedures using many different kinds of solvents and many different conditions of time, temperature, and quantities of solvent. The operation is essentially a batch operation and has a production rate of about 100 pounds of finished product a day. The installation consists of a mixing tank in which the raw ground fish and the solvent under study are slurried; two extractors; a centrifuge for the separation of liquid and solids; a solvent recovery system; and a vacuum tumbling dryer for the desolventization and final drying of the product. Tanks for solvent storage and for the collection of the dissolved material (miscella) are also provided.

Presently under study is a method for the production of fish protein concentrate from North Atlantic red hake, using isopropyl

Model-scale unit for producing fish protein concentrate by the solvent-extraction process installed in leased building and being operated by the Bureau of Commercial Fisheries technological laboratory, College Park, Md.

alcohol as a dehydrating and defatting agent. By late summer 1965, a commercially feasible method based on hake and isopropyl alcohol is scheduled to be available, as well as a complete definition of the characteristics of the product from this process and its nutritional value and wholesomeness.

Great Lakes

CHANGES PROPOSED IN COMMERCIAL FISHING REGULATIONS:

Several proposed changes in Great Lakes commercial fishing regulations were tentatively approved in June 1965 by the Conservation Commission of the State of Michigan. One was a recommendation by Michigan's Department of Conservation to close commercial fishing for lake trout in Lake Michigan on or after October 1, 1965.

The proposed restriction on lake trout commercial fishing in Lake Michigan is identical to that which has been in effect for several years in Lake Superior, and is tied to the long-range program to restore lake trout in the upper Great Lakes. The program is designed to protect lake trout populations being built up in Lake Michigan's northern waters, starting with the initial release in June 1965 of 1.2 million yearling fish.

As an exception to the general shutdown on commercial fishing for lake trout in Lake Michigan, a small number of licensed operators will be contracted and permitted to take lake trout so that information can be collected on survival, growth, reproduction, and distribution of planted stocks. As in the case of Lake Superior, those contract commercial fishermen will be limited to a quota each year--a lake trout catch quota carefully calculated to have no adverse effect on planted lake trout populations.

Another Great Lakes commercial fishing change approved by the Michigan Conservation Commission would provide a uniform November 1-30 closed season for taking whitefish in Lakes Huron, Michigan, and Superior. The revised closed season is timed with the peak spawning period for whitefish in all three of those lakes. Whitefish are now off limits to commercial fishermen from October 15 through December 10 in Lakes Michigan and Huron, and from November 1 through November 26 in Lake Superior. Also endorsed by the Commission is a measure which would allow commercial fishermen operating in those three lakes to take lake trout and whitefish with trap and pound nets in any depth of water. The use of such nets is now limited to 80 feet of water or less.

The last set of changes in Great Lakes commercial fishing regulations would lift the closed season and minimum size limit on yellow perch in Lake Erie where those controls are no longer needed.

Except for the lake trout restriction in Lake Michigan, the changes reflect the effort of Michigan's Department of Conservation to liberalize commercial fishing regulations where research findings point up the need and and practicality of doing so. The chief of the Department of Conservation's fish section explained that Michigan's present controls over commercial fishing in the Great Lakes are archaic and that they are the most conservative ones in effect in those waters. He added that many regulations have become outdated by shifts in the fishery of the Great Lakes, and that steps should and will be taken to bring them in line with today's developments.

The measures recently approved by the Michigan Conservation Commission will be discussed at public hearings. They will then go through a series of administrative steps before being brought back to the Commission for final action. (News Bulletin, Michigan Department of Comservation, June 17, 1965.)

* * * * *

LAKE TROUT RESTOCKING PROGRAM IN UPPER LAKES FOR 1965:

Continuing efforts to revive lake trout populations of the upper Great Lakes were to be stepped up in June 1965 with the release of over 3.1 million yearling fish, according to the Great Lakes Fishery Commission. Included in the June stocking schedule were some 1.9 million young fish for Lake Superior where 10 million trout have been planted since state, Federal, and Canadian agencies were coordinated under the Commission to start that phase of restoration work in 1958.

Sparked by the progress of sea lamprey control in tributaries of Lake Michigan, more than 1.2 million yearling lake trout

were to be set free in that lake's upper waters during the early part of June. It will be the first step to restock northern Lake Michigan where sea lamprey are scheduled to come under control by 1967. Because of their small size, fish going into those waters are expected to be safe from lamprey attacks during the next two years before lamprey populations are substantially reduced.

In Lake Superior, where continued good signs are seen of survival and growth among lake trout planted earlier, the June 1965 planting program was scheduled for the release of 900,000 fish in State of Michigan waters. Of that total, 600,000 fish would be released between Keweenaw Bay and Grand Marais. Other plantings along Michigan's shores included 200,000 fish in the Ontonagon area, and another 100,000 in lower Whitefish Bay. Most of the fish were raised from eggs supplied by the State of Michigan Conservation Department's Marquette Hatchery which is providing the bulk of planting stock for the restoration program.

Some 470,000 yearling trout were tc be released on the Canadian side of Lake Superior by the Ontario Department of Lands and Forests. Wisconsin and Minnesota were slated to stock their Lake Superior waters with 460,000 and 100,000 fish, respectively.

Lake Michigan plantings included the release of 850,000 trout at three locations between Seul Choix Point and Epoufette. Grand Traverse Bay and the Beaver Islands area would each receive 100,000 small lake trout. Some 200,000 fish were to be stocked off Door Peninsula in Wisconsin waters to round out the 1965 program for Lake Michigan. Planting stock for the entire Lake Michigan operation will be from the Federal Jordan River Valley Hatchery in northern Michigan. (News Bulletin, Michigan Department of Conservation, Lansing, May 27, 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 20.

* * * * *

ALEWIFE POPULATION IN LAKE MICHIGAN CONTINUES TO INCREASE:

The alewife population in Lake Michigan is still increasing sharply, with the 1964 hatch of that species nearly 50 times more abundant than in 1962, according to the U. S. Bureau of Commercial Fisheries Regional Office, Ann Arbor, Mich. The alewife, first reported in Lake Michigan in 1952, was not fished commercially prior to 1956. The alewife catch in Lake Michigan in 1964 was about 11.5 million pounds which was more than double the 1963 catch of that species.

Fish meal plants built in Milwaukee and Sturgeon Bay, Wis., in 1964 were expected to enable commercial fishermen to increase alewife production substantially resulting in additional economic benefits and also providing some degree of control over the population explosion of that species which has infiltrated a good part of the western Great Lakes.

The alewife is a native ocean fish species. In its newer habitat of the Great Lakes it seldom exceeds 8.5 inches in length, is quite oily, and very thin. (Great Lakes News Letter, March-April 1965.)

* * * * *

UNITED STATES-CANADIAN COMMERCIAL FISHERY LANDINGS, 1964:

The U. S. Great Lakes commercial fishery catch dropped to a new low in 1964 while Canadian landings that year were the lowest since 1952. The 1964 U. S. landings of 52.9 million pounds (estimated ex-vessel value $5.0 million) were 5 percent lower than in 1963 and the Canadian catch of 34.8 million pounds (ex-vessel value $4.1 million) was about 25 percent less than in 1963. Landings were lower in most of the Great Lakes except Lake Michigan where they increased substantially from the previous year.

Fig. 1 - Fresh-water fish packed with ice in wooden boxes and tubs.

Lake Michigan's 1964 landings of 25.7 million pounds accounted for nearly half the total U. S. Great Lakes catch. The gain was due to an increase of more than 100 percent in the catch of alewives. Totaling some 11.5 million pounds, that low-value species is used for animal food and fish meal, and accounted for 45 percent of Lake Michigan's 1964 landings. Yellow perch landings were up in 1964 but the chub catch dropped by one-third down to 5 million pounds.

Lake Erie was the most productive of the Great Lakes and in 1964 accounted for a U. S.-Canadian commercial catch of about 38.7 million pounds, a decline of 26 percent or 13.8 million pounds less than in 1963. Lake smelt accounted for half the Canadian 1964 commercial catch in Lake Erie with a total of 12.7 million pounds, while the U. S. catch of that species was less than a half million pounds.

Fig. 2 - Smelt.

In the Lake Huron-Georgian Bay area of the Great Lakes, the 1964 catch of chubs, as the leading commercial species, was lower than the previous year. The overall catch in Ontario waters increased in 1964 and there was a gain in both the Canadian and U. S. catch of yellow perch and whitefish.

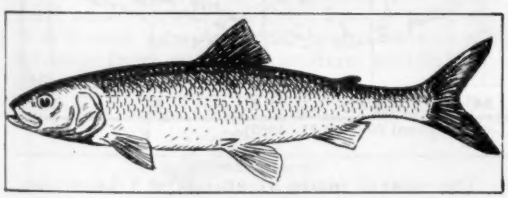


Fig. 3 - Lake herring.

The 1964 landings of herring in Lake Superior--the mainstay of commercial fishing in that lake--were lower than in 1963 but the smelt catch in U. S. waters of that lake increased. In 1964, the lake trout fishery in Lake Superior was again restricted to encourage the recovery of that species but at the same time allowing the continuation of biological studies. The U. S.-Canadian catch of lake trout in 1964 totaled about 219,000 pounds, only slightly more than in 1963. (Great Lakes News Letter, March-April 1965.)

Note: See Commercial Fisheries Review, March 1965 p. 33; October 1964 p. 25.

Gulf Fisheries Explorations and Gear Development

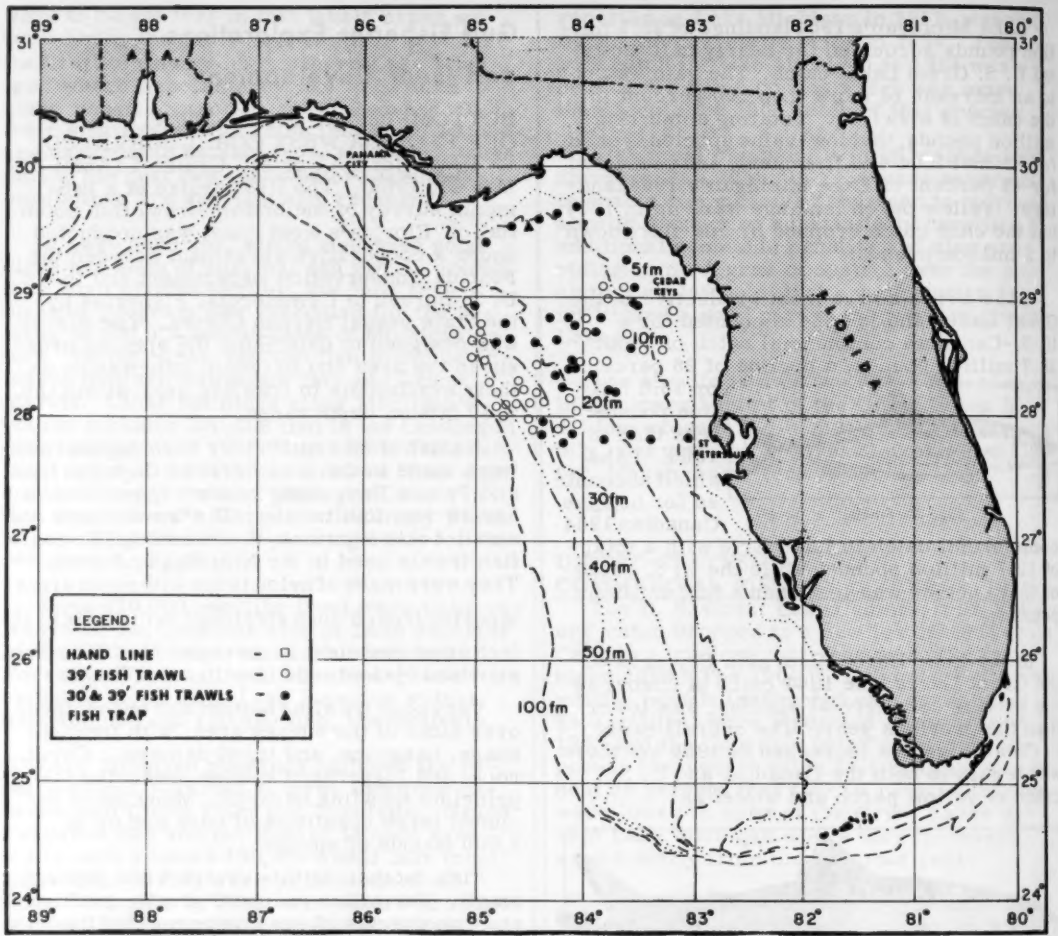
BOTTOM-TRAWL FISH POTENTIAL OFF FLORIDA WEST COAST SURVEYED: M/V "Hernan Cortez" Cruise 1 (April 29-May 21, 1965): The first cruise of a two-month survey of the bottom-trawl fish potential off Florida's west coast was conducted under a cooperative agreement between the Florida Conservation Department and the U. S. Bureau of Commercial Fisheries by the State vessel Hernan Cortez. The survey was designed to determine the species present in the area and to obtain information on their availability to trawling gear within the 5-50 fathom depth range.

A total of 88 exploratory trawling stations were made in the area between Cape San Blas and Tampa Bay, using roller-rigged 30-foot and 39-foot fish trawls. The trawls were small-scale versions of commercial bottom-fish trawls used in the New England area. They were made of nylon twine with mesh sizes tapering from 3-inch stretched in the body to $1\frac{5}{8}$-inch stretched mesh in the cod end and fished on standard $5\frac{1}{2}$-foot and 6-foot bracket doors.

Very poor trawling bottom was encountered over most of the survey area, with frequent snags, hang-ups, and trawl damage. Coral, rock, and loggerhead sponge presented the principle trawling hazards. Many hauls included large quantities of rock and up to 2,000 pounds of sponge.

Fish catches on this cruise were generally small. Vermilion snapper, grunts, goatfish, and two species of sea bass provided the only signs of commercial significance. Of the 64 catches of sea bass, 48 were bank sea bass and 19 black sea bass. A depth preference of the two species was observed with bank sea bass caught in waters deeper than 10 fathoms, while black sea bass were found inside the 10-fathom curve. Both those species were taken together on three occasions, each time from 10 fathoms.

Surface school observations revealed a few jumping fish, probably little tuna (Euthynnus alletteratus). Surface schools tentatively identified as scad (Decapterus sp.) were observed 6 to 7 miles offshore from Cape St. George to Cape San Blas. (For area of operations during the cruise see map on page 40.)



Area of operations during M/V Heman Cortez Cruise 1 (April 29-May 21, 1965).

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-29 (May 19-June 2, 1965): Small brown shrimp (68 count) were dominant in most trawl catches made in the up to 10-fathom depth during this cruise by the chartered research vessel Gus III. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., worked 8 statistical areas in another of a series of cruises in a continuing study of shrimp distribution in the Gulf of Mexico.

The vessel made 31 standard 3-hour tows with a 45-foot flat trawl, 48 plankton tows, 55 bathythermograph (BT), and 176 water (Nansen bottle) casts.

The more productive areas for small brown shrimp also yielded moderate catches of larger shrimp from various depths, and generally spotty catches of white shrimp ranging from 15-20 to 26-30 count.

The largest catch of the cruise was 75 pounds of brown shrimp (21-25 count) from a tow in the over 20-fathom depth range of area 21. The other depth ranges of that area accounted for mostly small brown shrimp of

Trawler Gus III (85 feet) chartered by the U.S. Bureau of Commercial Fisheries for shrimp research in the northern Gulf of Mexico.

68 count and a fair quantity of 31-40 count pink shrimp.

Area 14 yielded about 50 pounds of shrimp, with most of it running to large brown shrimp of 12-15 count from the greater depth ranges, but with both very small brown shrimp and large white shrimp (15-20 count) from the up to 10-fathom depth.

One 24-hour current measurement station was occupied by the vessel in 8 fathoms of water south of Morgan City, La. A total of 12 sediment samples was obtained there with a dredge from various locations within the study area.

Note: See Commercial Fisheries Review, July 1965 p. 25.

Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES: Production and Imports, January-April 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 4 months in 1965 amounted to 153,871 short tons--24,151 tons (or 13.6 percent) less than during the same period in 1964. Domestic production was 3,311 tons (or 21.2 percent) more but imports were 27,462 tons (or 16.9 percent) lower than in January-April 1964. Peru continued to lead other countries with shipments of 114,138 tons.

U.S. Supply of Fish Meal and Solubles, January-April 1965

Item	Jan.-Apr. 1/1965	Jan.-Apr. 1964	Total 1964
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	7,468	3,047	160,349
Tuna and mackerel	7,222	4,999	21,113
Herring	1,275	415	8,881
Other	2,997	7,190	44,909
Total production	18,962	15,651	235,252
Imports:			
Canada	14,059	19,300	54,769
Peru	114,138	130,276	348,025
Chile	3,458	7,396	12,942
So. Africa Rep.	700	4,578	18,581
Other countries	2,554	821	4,826
Total imports	134,909	162,371	439,143
Available fish meal supply	153,871	178,022	674,395
Fish Solubles:			
Domestic production 2/	5,606	7,293	93,296
Imports:			
Canada	706	737	1,553
So. Africa Rep.	-	604	987
Other countries	2,133	198	1,965
Total imports	2,839	1,539	4,505
Available fish solubles supply	8,445	8,832	97,801

1/Preliminary.
2/50-percent solids.

The United States supply of fish solubles during January-April 1965 amounted to 8,445 tons--a decrease of 4.4 percent as compared with the same period in 1964. Domestic production dropped 23.1 percent, but imports of fish solubles increased 84.5 percent.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES: Production, April 1965: During April 1965, a total of 10,781 tons of fish meal and 10.2 million pounds of marine-animal oil was produced in the United States. Compared with April 1964 this was an increase of 2,671 tons

U. S. Production of Fish Meal, Oil, and Solubles, April 1965 1/ with Comparisons

Product	April 1/1965	April 1964	March 1/1965	March 1964	Jan.-Apr. 1/1965	Jan.-Apr. 1964	Total 1964
	(Short Tons)						
Fish Meal and Scrap:							
Herring	236	-	497	-	1,275	415	8,881
Menhaden 2/	7,305	2,917	-	-	7,468	3,047	160,349
Tuna and mackerel	1,748	1,660	1,925	1,214	7,222	4,999	21,113
Unclassified	1,492	3,533	732	1,922	2,997	7,190	34,909
Total	10,781	8,110	3,154	3,136	18,962	15,651	225,152
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	3/	3/	10,100
Grand total meal and scrap	3/	3/	3/	3/	3/	3/	235,252
Fish Solubles:							
Menhaden	2,147	1,310	-	-	2,147	1,370	68,738
Other	1,030	2,582	957	994	3,459	5,923	24,558
Total	3,177	3,892	957	994	5,606	7,293	93,296
	(1,000 Pounds)						
Oil, body:							
Herring	105	-	184	-	576	132	10,354
Menhaden 2/	9,603	3,000	-	-	9,698	3,063	157,730
Tuna and mackerel	239	353	354	214	1,063	906	4,816
Other (including whale)	205	1,038	120	464	504	1,723	7,298
Total oil	10,152	4,391	658	678	11,861	5,824	180,198

1/Preliminary data.
2/Includes a small quantity of thread herring.
3/Not available on a monthly basis.

of fish meal and about 5.8 million pounds of marine-animal oil. Fish solubles production amounted to 3,177 tons--a decrease of 715 tons as compared with April 1964.

* * * * *

Major Indicators for U. S. Supply, April 1965: United States production of fish meal and fish oil in April 1965 was higher by 32.9 and 131.2 percent, respectively, as compared with April 1964. Production of fish solubles was lower by 18.4 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, April 1965

Item and Period	1/1965	1964	1963	1962	1961
	(Short Tons)				
Fish Meal:					
Production:					
April	10,781	8,110	8,340	9,359	6,112
Jan.-Apr. 2/	18,962	15,651	16,314	20,161	13,657
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
April	39,721	55,953	26,607	26,390	19,060
Jan.-Apr.	134,909	162,371	133,083	89,164	63,393
Year	-	493,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
April	3,177	3,892	5,037	4,305	2,965
Jan.-Apr. 2/	5,606	7,293	10,398	9,976	8,799
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
April	315	457	218	323	220
Jan.-Apr.	2,839	1,539	1,678	3,153	729
Year	-	4,505	7,112	6,308	6,739
	(1,000 Lbs.)				
Fish Oils:					
Production:					
April	10,152	4,391	6,551	5,645	3,344
Jan.-Apr. 2/	11,861	5,824	7,852	8,162	4,665
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
April	145	22,773	28,480	10,270	7,351
Jan.-Apr.	11,743	46,693	75,401	51,593	43,900
Year	-	151,469	262,342	123,050	122,486

1/Preliminary.
2/Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.
3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
4/No homogenized fish was produced in 1964.

* * * * *

Production by Areas, May 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for May 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, May 1965 (Preliminary) with Comparisons

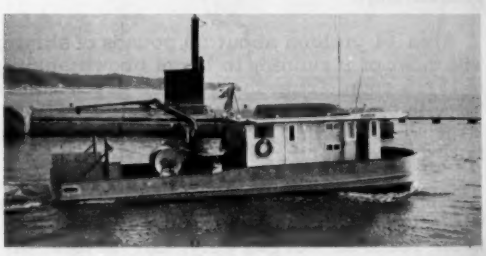
Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
May 1965:			
East & Gulf Coasts	22,631	22,253	9,765
West Coast 2/	1,720	290	1,139
Total	24,351	22,543	10,904
Jan.-May 1965 Total	43,421	34,491	17,717
Jan.-May 1964 Total	47,698	35,763	20,152

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes American Samoa and Puerto Rico.

Inland Fisheries Research

NEW TYPE RESERVOIR FISHERY RESEARCH VESSEL:

The new reservoir fishery research vessel, the Hiodon, of the U. S. Bureau of Commercial Fisheries, was launched at Saugatuck, Mich., in April 1965.



Reservoir fishery research vessel Hiodon of the U.S. Bureau of Commercial Fisheries.

The new steel vessel (45 feet long, 14 feet wide, and 16 gross tons) is designed for shallow-water operation. She has a flat bottom and tunnel stern which completely protects its twin propellers and rudders. Propulsion power is supplied by two 85-hp. diesel engines. Equipped with the latest in hydraulic deck gear (including separated trawl winches, net reel, power block, and articulated crane, all of which are controlled from a central station), the vessel can engage in a variety of fishing methods.

The Bureau's new research vessel is also equipped with a roofed and partially enclosed laboratory area and has two 600-gallon fish tanks with circulating water systems for holding live fish. She has a detachable heavy-duty axle and wheel assembly to facilitate launchings, hauling out, and transporting on

land without the need for special equipment and trailers usually required to handle vessels of that size and weight. The vessel has living accommodations for a crew of 4 for periods of up to 2 weeks.

Shakedown trials of the new vessel were completed in Lake Michigan near Saugatuck the latter part of May after which she sailed for Mobridge, S. D., by way of Lake Michigan, Illinois-Mississippi-Missouri River Systems for most of the way. The vessel's new hauling rig was used to transport her overland the remaining 300 miles to Oahe Reservoir at Pierre, S. D.

Dedication ceremonies for the Hiodon were scheduled for early June in Mobridge.

Irradiation Preservation

FISHERIES INDUSTRY
INVITED TO JOIN
STUDY OF SEAFOOD:

The Atomic Energy Commission (AEC) is seeking the cooperation of the fisheries industry in carrying out studies of radiation-processed seafood.

RADIATION PRESERVATION OF SEAFOOD
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF COMMERCIAL FISHERIES
FRESH SEAFOOD ON ICE WILL KEEP ABOUT 14 DAYS
IRRADIATION
WILL DOUBLE THIS KEEPING TIME AND INCREASE FRESH FISH SALES
HIGH QUALITY FROZEN FISH WILL REACH
INLAND MARKETS
COOPERATIVE
GOVERNMENT-INDUSTRY
STUDIES

The Commission's Marine Products Development Irradiator, located at the Gloucester (Mass.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries, will be used in the studies. The irradiator is the only one in the world expressly designed for pasteurization of fishery products. The plant was licensed by the AEC on March 17, and was fully operational on April 19, 1965. The pilot plant's radiation chamber contains a 250,000-curie cobalt-60 source which is capable of processing fishery products at the rate of 1 ton an hour.

Fishery products treated in the irradiator are still fresh, raw, and cold when they emerge from the radiation chamber. Pasteurization--reduction of bacteria--is accomplished by radiant energy. Extensive research has shown that this new, heatless pasteurization process will double or triple the shelf life of fresh fishery products. After irradiation, the fish are kept at refrigerator temperatures.

The marine products irradiator at Gloucester will be available to the fisheries industry for experimental processing of limited quantities of seafood for shipping, storage, and acceptability tests and for evaluation of the product in commercial plant and laboratory facilities. Irradiated products will not be made available for commercial use or sale to the public at this time. The information obtained will be helpful in further developing the process for future commercial application.

Commercial seafood processors and distributors interested in negotiating a cooperative agreement with the AEC at no cost should contact the Director, Division of Isotopes Development, U. S. Atomic Energy Commission, Washington, D. C. 20545.

Maine Sardines

CANNED STOCKS, JUNE 1, 1965:

Canners' stocks of Maine sardines on June 1, 1965, were down sharply from those of the same date in 1964 and 1963.

Final data show the 1964 pack as 865,751 standard cases (100 cans of $3\frac{3}{4}$-oz.) canned in 23 plants in Maine. That was much less than the 1,619,000 cases packed during 1963, but more than the 754,000 cases packed during the regular season in 1961 when fishing was extremely poor.

The new Maine sardine canning season opened on the traditional date of April 15, 1965, and the pack to July 3, 1965, totaled 265,000 standard cases, as compared with the pack to July 3, 1964, of 100,000 cases. Generally, the pack during June 1965 consisted of smaller fish which yield a high-quality pack.

The new law legalizing year-round canning of Maine sardines will remove the tra-

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, June 1, 1965, with Comparisons 1/

Type	Unit	1964/65 Season				1963/64 Season					1962/63 Season		
		6/1/65	4/1/65	1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63
Distributors	1,000 actual cases	198	236	238	291	234	254	291	261	308	217	215	264
Canners	1,000 std. cases 2/	203	314	538	629	514	499	658	1,063	1,255	643	536	699

1/ Table represents marketing season from November 1-October 31.

2/ 100 3¾-oz. cans equal one standard case.

Source: U.S. Bureau of the Census, Canned Food Report, June 1, 1965.

ditional December 1 closing date for the packing season. The new legislation will open winter canning to all Maine sardine packers and will allow winter canning with domestic as well as imported herring.

Note: See Commercial Fisheries Review, July 1965 p. 27

Michigan

FEDERAL FUNDS REQUESTED FOR LAKE TROUT STUDY:

Michigan's Department of Conservation filed a request in May 1965 for $40,400 in Federal funds for an extensive study on the progress of lake trout restoration work in State of Michigan waters of Lake Michigan during the 1965/66 fiscal year. Funds for the lake trout assessment study, which is planned as a continuing annual project, are being sought through the U. S. Fish and Wildlife Service under provisions of the new Commercial Fisheries Research and Development Act. Plans for undertaking this full-scale study were timed with the June 1965 initial stocking of 1.2 million marked yearling lake trout in northern waters of Lake Michigan.

As spelled out in its application for Federal funds, Michigan's Department of Conservation plans to concentrate opening investigations in that part of Lake Michigan where sea lamprey control efforts were started several years ago and where re-establishment of lake trout populations is most likely to occur first. Under the proposed project, lake studies would cover such major checkpoints as the progress of sea lamprey control, the survival of planted trout as they are affected by predation and harvests of commercial and sport fishermen, and the dispersal of those fish in Lake Michigan after they are released. Field checks will also be made to measure the growth and spawning success of planted lake trout, and their use of natural food supplies in the lake. Additional investigations will be conducted on the relationship between lake trout and other species, and on commercial fishery statistics.

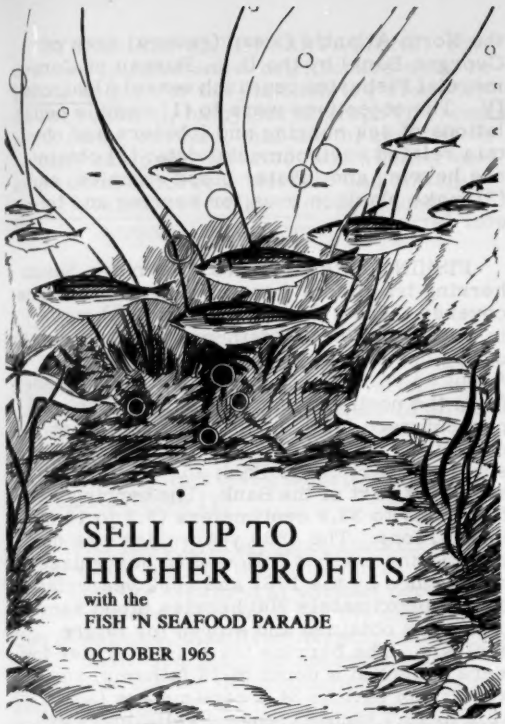
It is expected that commercial fishing for lake trout will be closed in Lake Michigan, as it has been in Lake Superior, until the rehabilitation of that species appears to be a sure thing. If so, a small number of commercial operators will be contracted to make modest catches of lake trout to collect scale and stomach samples and other needed biological information. From commercial catches, Michigan's Conservation Department would also examine lake trout for lamprey scars. This would supplement fact-finding efforts by the U. S. Bureau of Commercial Fisheries which are already under way to evaluate the status of the sea lamprey program in Lake Michigan. (News Bulletin, Michigan Department of Conservation, Lansing, May 27, 1965.)

National Fisheries Institute

SELL UP TO HIGHER PROFITS IS THEME OF 1965 "FISH 'N SEAFOOD PARADE":

Profit is the key to the fall 1965 "Fish 'n Seafood Parade" promotion, according to the chairman of the Fish 'n Seafoods Promotions Division of the National Fisheries Institute (NFI). The chairman, who is also first vice-president of NFI, said the entire program has been planned to assist retailers and mass-feeding operators to "sell up to higher profits."

The "Fish 'n Seafood Parade" promotional campaign for 1965 is three-pronged--advertising, publicity, and point-of-purchase materials--and is backed up by more industry advertising than ever before. The biggest promotion of its kind, sponsored by industry and government, will begin this summer with full-page advertisements in retail trade magazines showing that fish and sea-



Motif being used for the fall 1965 "Fish 'n Seafood Parade."

food yield the greatest gross profit per square inch of freezer space--the results of a nine-year survey of Kings Super Markets of New Jersey. Other testimonial advertisements, to appear in institutional trade magazines, will feature a well-known White Plains, N.Y., restaurant, which shows a healthy profit of the seafood dishes it serves.

A full-scale publicity campaign to acquaint all buyers of foods with the "Parade" and the benefits of serving fish and seafoods--whether eaten at home or away from home--will be channeled through national and mass-feeding magazines, special-interest publications, and newspapers. Fish and shellfish cookery--ease of preparation, versatility, and nutrition--will be brought to the attention of homemakers throughout the United States through the medium of television and radio. Store displays, posters, counter cards, bar strips, and menu clip-ons all will feature beautiful underwater photography.

Area "Fish 'n Seafood Parade" committees are now being formed. Those committees are made up of industry people who will plan local publicity and advertising promotions to tie in with the national campaign.

All promotions--both national and regional--will have the full cooperation of the U. S. Bureau of Commercial Fisheries, as in the past. The Bureau's field representatives will work closely with committees of businessmen in carrying out their regional promotion programs. Fishery bulletins and cookery leaflets distributed by the U.S. Bureau of Commercial Fisheries will feature the economy and easy availability of fishery products.

Note: Merchandising materials for the promotional campaign may be obtained through seafood packers and processors, or by buying them direct from the Fish 'n Seafoods Promotions Division, National Fisheries Institute, 1614 20th Street NW., Washington, D. C. 20009.

North Atlantic

SOVIET FISHING ACTIVITY OFF COAST, JUNE 1965:

Soviet fishing activity in the Northwest Atlantic increased substantially during June 1965. A total of 178 vessels were sighted and identified as 48 factoryship stern trawlers, 116 refrigerated and nonrefrigerated side trawlers, 10 processing and refrigerated fish transports, 3 base ships, and one fuel and water carrier. This compared with an estimated 125 vessels sighted in May and 120 vessels in June 1964.

Fig. 1 - Large Soviet factory stern trawler of the "Tropik" class in the North Atlantic.

The larger number of vessels in June was attributed to the deployment of some 60 vessels of the SRT and SRTR classes from the Sable Island area to Georges Bank. It was believed the lack of fish in the former area prompted the move.

Soviet fishing operations during the month generally ranged from south of Martha's Vineyard eastward along the 100-fathom curve of the Continental Shelf to the south-

west and southeast parts of Georges Bank--120 to 175 miles southeast and east of Cape Cod.

Fig. 2 - Soviet refrigerated fish transport operating in Northwest Atlantic.

Although most of the vessels appeared actively engaged in fishing operations, only moderate catches of predominantly whiting and lesser quantities of herring were observed being taken. Toward the end of the month a fleet of Soviet vessels was sighted 40 miles south of Martha's Vineyard. That area is generally regarded productive for whiting about that time of year. United States fishermen reported good catches about 25 miles north of that area.

Fig. 3 - Soviet fishery base ship in Northwest Atlantic.

There were no reports during the month of Soviet fishing activity along the middle Atlantic Coast areas. Information received indicated that about 20 Soviet vessels fished those areas in May. In May 1964 a total of 14 Soviet SRT's and SRTR's were sighted off the North Carolina coast.

Note: See Commercial Fisheries Review, July 1965 p. 30.

North Atlantic Fisheries Investigations

HERRING AND LOBSTER OFFSHORE POPULATION STUDIES CONTINUED:

M/V "Albatross IV" Cruise 65-8 (June 8-18, 1965): Biological investigations related to offshore populations of herring and lobsters were conducted during this cruise in the North Atlantic Ocean (general area of Georges Bank) by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The objectives were to (1) sample populations of sea herring and lobsters and obtain related environmental data; (2) obtain sea herring and lobster blood samples; and (3) make plankton tows for herring and lobster larvae.

FISHING OPERATIONS: Herring: Seven herring trawl sets were made at the stations covered. The sets (1 hour duration) made in waters of 30 to 45 fathoms yielded a total of 204 bushels (15,000 pounds) of herring. About 75 percent of the herring caught were from the northern part of Georges Bank, 23 percent were from south of the southeast part of the Bank, and 2 percent from the southeast part of the Bank and east of the southeast part of the Bank. The herring were from 23.5 to 33.9 centimeters (9.3 to 13.3 inches) long. The 1960 year-class was dominant in the catches followed in percentage occurrence by the 1961 and 1962 year-classes. Approximately 200 herring blood samples were obtained and stored for future analysis. The herring taken in a lobster tow were caught at a depth of 75 fathoms, and were from 31.0 to 34.8 centimeters (about 12.2 to 13.7 inches) long. Preliminary examination showed that the majority of fish in the sample were from the 1958 and 1957 year-classes.

Lobster: A total of 30 trawl sets were made at the 7 lobster stations worked. The sets made in depths ranging from 65 to 250 fathoms yielded 397 lobsters--239 females, and 158 males. Of the females, 143 were berried (egg-bearing), and half of them had ripe eggs. Three of the females were spent. The mean weight of the catch was around 5 pounds and ranged in weight from $\frac{1}{4}$ to 16 pounds. Some 200 lobster blood samples were taken for future analysis. At Veatch's Canyon on Georges Bank, lobsters were concentrated west of the Canyon at 150 to 250 fathoms. At Corsair Canyon, lobsters were concentrated southwest of the Canyon at 65 to 100 fathoms.

PLANKTON OPERATIONS: Herring: A total of 28 one-meter net plankton tows of 15 minutes duration (5 minutes each at depths of 32.8 feet, 16.4 feet, and at the surface) were made during the cruise. Lobster: Eight 1-meter net plankton tows lasting 15 minutes each (at the surface) were made.

HYDROGRAPHIC OBSERVATIONS: Five sea-bed drifters and 5 drift bottles were released at each of the plankton tow stations. At each station, bathythermograph (BT) casts were made; surface, mid-depth, and bottom salinity samples collected; and weather observations recorded. Surface and bottom temperatures were taken and recorded.

Note: See Commercial Fisheries Review, July 1965 p. 35.

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CONTINENTAL SHELF WATERS SURVEYED:

M/V "Albatross IV" Cruise 65-7 (May 19-June 3, 1965): To conduct an environmental survey of Continental Shelf waters in an area bounded by longitudes 64°30' W. and 72°30' W. was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 76 hydrographic stations was occupied throughout the cruise area. Water samples were obtained at various depths up to 250 meters (820 feet) for the determination of salinity, dissolved oxygen, and chlorophyll. Also, 228 bathythermograph casts were made for the determination of temperature. In addition, 24 hydrographic stations were occupied at 2-hour intervals at a moored buoy and at a floating buoy moored with a parachute drogue to determine the temporal fluctuations of these properties, and of zooplankton biomass due to tidal oscillations and internal waves.

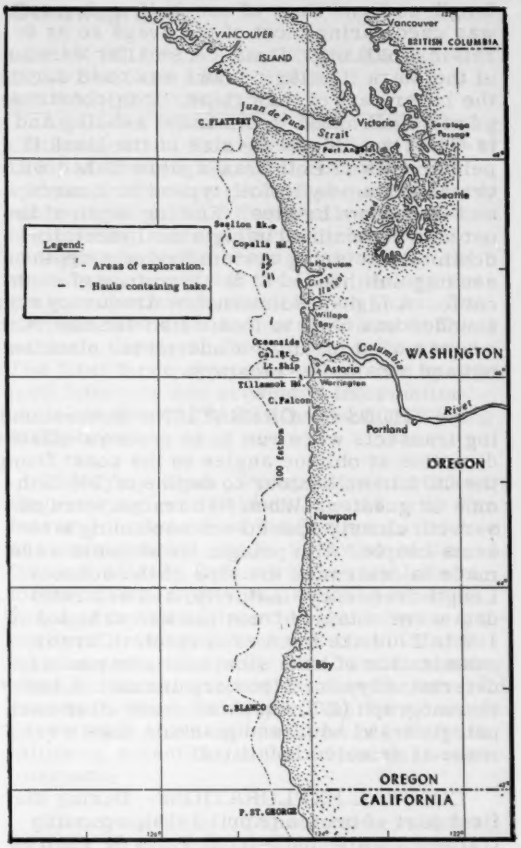
The Albatross IV was scheduled for another cruise on June 8 to the vicinity of Georges Bank in the North Atlantic to study the distribution of sea herring and lobsters in relation to their environment.

Note: See Commercial Fisheries Review, July 1965 p. 35; February 1965 p. 35.

North Pacific Fisheries Explorations and Gear Development

HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 71 (April 1-May 27, 1965): Explorations for Pacific hake (Merluccius productus) along the Pacific coast from Cape Flattery, Wash., to Pt. St. George, Calif., and in selected areas of Puget Sound were conducted during this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.



Shows areas of exploration during M/V John N. Cobb Cruise 71 (April 1-May 27, 1965).

Principal objective of the cruise was to determine when and where Pacific hake schools appear off the coasts of Washington and Oregon in the spring. Secondary objectives were to obtain: (1) further information on the seasonal availability of Pacific hake in Puget Sound waters; (2) additional data relative to the catching efficiency of the "Cobb" pelagic trawl, and (3) biological data on Pacific hake, such as degree of maturity, size and sex composition of catches, and the presence or absence of hake larvae and eggs.

GEAR USED: The principal gear used during the explorations was a Mark II "Cobb" pelagic trawl constructed of 3-inch mesh monofilament webbing. A three-quarter

length cod-end liner of one-half-inch mesh was used during most of the drags so as to retain small organisms. A smaller version of the Mark II pelagic trawl was used during the latter part of the cruise. It is constructed of 2-inch mesh multistrand webbing and is about two-thirds the size of the Mark II pelagic trawl. Both trawls were fished with two aluminum hydrofoil-type otter boards and 60-fathom bridles. Fishing depth of the net was determined using a dual electrical depth telemetering system having a depth-sensing unit housed at the terminus of each cable. A high-resolution, low-frequency echo-sounder was used to locate fish schools. Other gear used included a one-meter plankton net and a bathythermograph.

METHODS OF OPERATION: Echo-sounding transects were run in an onshore-offshore direction at oblique angles to the coast from the 30-fathom contour to depths of 200 fathoms or greater. When fish traces were observed, closely spaced echo-sounding transects coupled with pelagic trawl hauls were made to determine the size of the schools. Length frequency, maturity, and sex ratio data were obtained from random samples of 100 to 200 hake from each catch. Cursory examination of hake stomachs was made to determine types of food organisms. A bathythermograph (BT) cast was made after each pelagic trawl haul, and plankton tows were made at selected localities.

COASTAL EXPLORATIONS: During the first part of cruise (April 1-19), sounding transects were made from Point St. George to Cape Flattery. Heavy echo traces suggestive of Pacific hake were observed off St. George reef, Calif., on April 4 and off Oceanside, Wash., on April 15. The fish traces off St. George reef were at a depth of 24 fathoms over a bottom depth of 44 fathoms. Sea lions were observed in the vicinity feeding on what appeared to be hake. The pelagic trawl could not be fished because of large northwest swells. Fish traces observed off Oceanside were over bottom depths of 35 to 45 fathoms. A half-hour pelagic trawl haul was made on those traces, but no hake were caught. The catch consisted mainly of about 350 pounds of anchovies (Engraulis mordax) and 80 pounds of yellowtail rockfish (Sebastodes flavidus). Only two other hauls were made during the period, both of them off Cascade Head, Oreg. Neither haul yielded any hake.

During the latter part of the cruise (May 6-25), sounding transects were made from Cape Flattery to Cape Falcon, Oreg. Hake schools were first encountered off Grays Harbor and Copalis Head on May 7. The schools were not heavily concentrated, being scattered in isolated aggregations from about the 40-fathom contour to the edge of the Continental Shelf, with most frequent occurrences between the 45-60-fathom contours. Five hauls made in the vicinity of Copalis Head and Grays Harbor yielded from 152 pounds to 29,290 pounds of hake per hour of trawling. The 152-pound catch also contained 4,000 pounds of anchovies, 1,000 pounds of herring, and 2,000 pounds of yellowtail rockfish. Sounding transects southward of Grays Harbor located hake schools north of the Astoria Canyon, over the eastern edge of the Canyon, southwest of the Columbia River lightship and off Tillamook Head. The school north of Astoria Canyon was concentrated in a narrow band over bottom depths between 66-70 fathoms, and extended in a north-south direction for about 5 miles. A half-hour haul made on that school yielded a 6,150-pound catch, of which 6,000 pounds were hake.

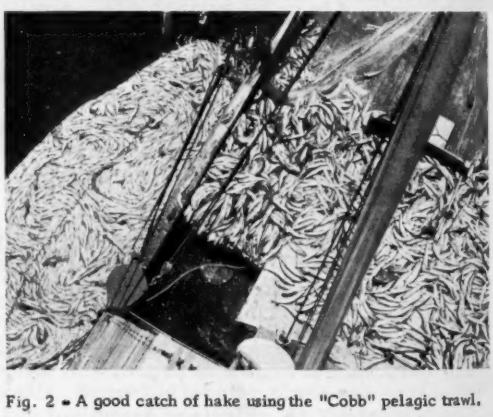


Fig. 2 - A good catch of hake using the "Cobb" pelagic trawl.

The schools over the Astoria Canyon and southwest of the Columbia River lightship were small and produced light to moderate echo traces. The school off Tillamook Head extended over a bottom depth interval of 45 to 68 fathoms and was about 20 fathoms off the bottom. Its north-south extent was not defined. A half-hour haul with the smaller pelagic trawl made on that school yielded 5,000 pounds, consisting almost entirely of hake.

Sounding transects were continued in the vicinity of Willapa Bay and Grays Harbor during May 17-25. Eight hauls made during that period yielded from 400 to 48,000 pounds of hake per hour of pelagic trawling. The 400-pound catch was made off Sealion Rock, the most northern limit where hake were found. The 48,000-pound haul was made off Grays Harbor over bottom depths of 52-55 fathoms on the heaviest echo traces observed during the cruise.

No hake were encountered off Washington and Oregon from April 1 to 19. During the latter part of cruise (May 7-25), hake were taken as far north as Sealion Rock.

EXPLORATIONS IN PUGET SOUND: Pacific hake were found in northern Puget Sound, Hood Canal, and Saratoga Passage. Two of 5 hauls of one-half hour duration made in northern Puget Sound accounted for catches of 2,500 and 5,500 pounds of hake. The remaining 3 hauls in northern Puget Sound were made to test the fishing and telemetry gear. Two drags were made in Saratoga Passage; 1 drag was for test purposes and the other yielded 150 pounds of hake. Two half-hour hauls in Hoods Canal yielded 2,500 and 3,500 pounds of hake.

FISH SIZE, MATURITY, AND STOMACH CONTENTS: Samples of hake taken in Puget Sound were smaller than those caught off Washington and Oregon. Puget Sound hake ranged in size from 7 to 68 centimeters (2.8 to 26.8 inches) and their size composition showed three distinct modes--4.7, 9.8, and 14.2 inches. Hake taken off Washington ranged in size from 40 to 68 centimeters (15.7 to 26.8 inches) with a mode at 53 centimeters (20.9 inches). Those off Oregon and the Columbia River entrance ranged in size from 40 to 77 centimeters (15.7 to 30.3 inches) with a mode at 50 centimeters (19.7 inches).

OTHER ACTIVITIES AND OBSERVATIONS: In cooperation with the Bureau's Seattle Technological Laboratory, hake were delivered to several reduction plants for meal- and oil-yield tests and to a processing plant for fillet studies.

Pacific lamprey (Entosphenus tridentatus) were taken in several catches off Oregon and Washington. Several hake were found with serious lamprey-inflicted wounds, which had penetrated the peritoneum.

Note: See Commercial Fisheries Review, May 1965 p. 27.

Oceanography

OCEAN SCIENCE AND ENGINEERING CONFERENCE AND EXHIBIT AT WASHINGTON, D. C.:

An Ocean Science and Ocean Engineering Conference and Exhibit was held June 14-17, 1965, at Washington, D. C. Six different symposia of both a general and specialized nature were given. Perspectives in ocean engineering, underwater vehicles, atomic energy uses in the ocean, marine mineral resources, results of the U. S. biology program in the International Indian Ocean Expedition, and distribution of Columbia River water in the North Pacific were discussed. The first three symposia cut across specialized interests and presented information useful to several scientific and engineering disciplines.

The symposium "Perspectives in Ocean Engineering" was held on June 17, with Professor John Isaacs of the Scripps Institution of Oceanography and D. S. Potter of the General Motors Defense Research Laboratories as chairmen. It discussed several fields of ocean engineering that require generalized development at this time. Major topics were motion in the sea, remote sensing, and mechanical properties of sediments. Advances in those fields are considered necessary at this time and would be of benefit to military, scientific, and commercial ocean interests.

The symposium on underwater vehicles on June 16 encompassed three topics: (1) present design and operational parameters involved in existing underwater vehicles; (2) future vehicles, both manned and unmanned, and their design concepts; and (3) materials now used in the construction of underwater vehicles and those likely to be used in the future.

A special symposium called "Nuclear Power for use in the Ocean" was sponsored jointly by the Atomic Industrial Forum and the Marine Technology Society. Held on June 17, it was devoted to existing and potential uses of nuclear power from the points of view of requirements and capabilities. Power sources for deep submergence and industrial applications of nuclear power for the extraction of oil and minerals were discussed.

The Conference and Exhibit was co-sponsored by the Marine Technology Society and

the American Society of Limnology and Oceanography, and also included sessions of contributed papers and special panels and addresses.

Note: See Commercial Fisheries Review, May 1965 p. 30; Mar. 1965 p. 45.

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PLANS FOR NUCLEAR-POWERED RESEARCH SUBMARINE STUDIED BY INTERIOR DEPARTMENT:

A study sponsored by the U. S. Bureau of Commercial Fisheries shows that it is feasible to build a specially designed nuclear-powered submarine for fishery and oceanographic research, said Secretary of the Interior Stewart L. Udall, June 17, 1965. The study was conducted by a firm noted as the pioneer submarine designer and builder that developed the nuclear submarines Nautilus, Skipjack, George Washington, and others.

United States scientists have long desired an oceanographic underseas craft of a speed, range, and maneuverability that only a nuclear craft possesses, the Interior Secretary noted. Such a submarine could study fish behavior, distribution of resources, disposal of atomic wastes, water temperatures, salinity, and many other oceanographic problems that are now approached mostly by means of instruments lowered from the deck of a ship. The Soviet Union has used a converted military submarine in fishery studies for several years, but the conventional underseas craft lacks speed, maneuverability, and many scientific advances that an atomic submarine could have.

According to the preliminary study by the submarine designing contractor, the new research vessel would be 163 feet long, 23 feet in diameter, and carry a crew of 24, plus 7 scientists. It would be able to operate at depths as great as 1,000 feet and while submerged be capable of 20 knots, a speed at which some of the swifter tuna swim. Fishery scientists believe most of the great fishery resources are located in the layer between the surface and a depth of approximately 1,000 feet. Throughout that range they would be able to observe fish and other marine organisms in their natural environment and collect samples at known depths. Such knowledge would permit man to undertake more sophisticated approaches to harvesting the resources of the sea.

Among scientific advances contained by the atomic vessel would be an observation sphere in the bow, remote controlled television cameras for areas not visible from the bow, and a complex system of sampling instruments providing oceanographic data to a computer aboard the vessel. One of the principal advantages of an atomic craft, in addition to its advanced scientific equipment, said Donald L. McKernan, Director of the Bureau of Commercial Fisheries, would be its capability of making continuous scientific observations under sea conditions too rough for most surface oceanographic vessels, especially during the winter.

The research submarine would cost an estimated $25 million. The Bureau Director said that while the cost may seem high, "bold new approaches to scientific problems, such as this type of vessel represents, are necessary if the United States' share of the world's fisheries is to be increased." He added that the National Academy of Sciences' Committee on Oceanography estimated that the present contribution of United States fisheries to the Gross National Product is $1 billion annually. He said the Committee also predicted that the $1 billion figure could be tripled in 10 years if ocean research were conducted on a sufficiently broad scale. And he pointed out that this does not include other scientific contributions which would result from the broad scale oceanographic research to be undertaken by an atomic submarine. Director McKernan said he has asked the National Academy of Sciences to set up a special committee to assess various aspects of the study and to advise the Bureau how best to proceed.

Note: See Commercial Fisheries Review, May 1963 p. 35.

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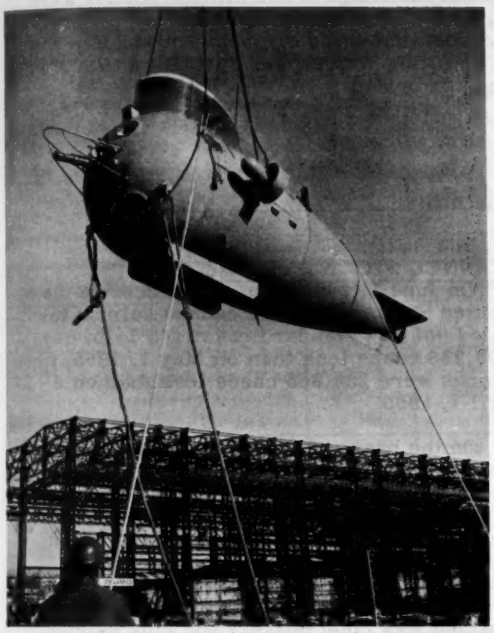
SUBMARINE USED TO EXPLORE SEA FLOOR OFF RHODE ISLAND:

University of Rhode Island scientists were scheduled to explore the sea floor of Narragansett Bay and Block Island Sound for a 12-day period starting June 2, 1965, using a 2 man submarine named for the Phoenician goddess Asherah.

Capable of descending to a maximum depth of 600 feet and moving at speeds up to 4 knots, the electric-powered submarine was constructed by a private firm for the University of Pennsylvania Museum which, in cooperation with the National Geographic Society, used the vehicle for underwater



A2-man electric submarine explores the sea floor off Rhode Island.

archeological exploration in the Aegean Sea off the Turkish coast in the summer of 1964.

The associate professor of geological oceanography who conceived the Rhode Island project said he wanted to explore the underwater hills, valleys, and other "topographic" features off the Rhode Island coast. He was particularly interested in the area from Castle Hill north in the East Passage. "There's a deep valley here nearly 200 feet deep. It is unusual in that it's fairly deep, yet close to land," he explained. He also hoped to learn something about the actions of physical and biological agents on the bottom itself. In addition to direct observations, he planned to make a photographic and audio-tape record of bottom features.

His activities, including the costs of services for the submarine, its support equipment, and its personnel, are covered by contracts with the Office of Naval Research.

If submersibles prove to be a useful tool in his work, he said he may take advantage of an opportunity in 1966 to use a submarine capable of going to depths of several thousand feet.

Another Rhode Island oceanographer was scheduled to spend 2 days in Block Island and Long Island Sounds attempting to survey the density and locations of plants in depths up to 140 feet. His work is supported by the National Institutes of Health. If scientists can learn more about underwater plant growth, sewage and other organic materials draining into coastal areas might be handled to re-enrich the water instead of polluting it. The wastes would then serve as a sort of marine fertilizer promoting the growth of desirable marine plants and indirectly providing food for various marine organisms.

Throughout the operations the 41-foot workboat Billie II was to act as a tender and tug, carrying necessary support equipment. An observer-maintenance man, was to remain on the surface in continuous communication with the submarine.

The submarine has six viewports, which allow observation forward, downward, and to the sides. In addition, a plexiglass free-flooding "bubble" above the main hatch provides 270-degree visibility when the vessel is on the surface and protects the hatch area so that personnel may be transferred while afloat.

Driven by two side-mounted rotatable electric propulsion pods (two horsepower each), the vehicle can move in all directions. Commenting on its ability to hover, the University of Pennsylvania Museum said in a publication that the vehicle "Maneuvered like a helicopter." It is 17 feet long, weighs 8,500 pounds, and is capable of operating underwater for 10 hours under normal conditions. However, it is equipped with an air rebreathing and oxygen system sufficient to maintain the operator and observer for 24 hours, if necessary. (University of Rhode Island, May 28, 1965.)

Retail Prices

FISHERY PRODUCTS
RETAIL PRICE INDEXES, 1963-65:

The U. S. retail price index for fishery products in 1964 was at 107.4 percent of the 1957-59 average, as computed by the Bureau of Labor Statistics, U. S. Department of Labor. Compared with the 1963 index of 110.0 percent, retail prices for fishery products in 1964 were down 3.2 percent.

Based on an average price index of 109.8 in the first quarter of 1965, retail prices for fishery products were down 1.7 percent from the same quarter in 1964. (National Food Situation, NFS-112, May 1965, U. S. Department of Agriculture.)

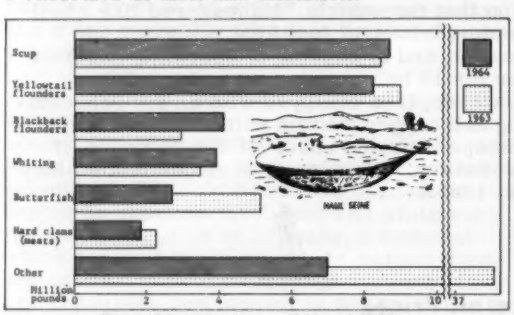
Note: Indexes revised by Bureau of Labor Statistics beginning January 1964. Item selection and quantity weights for foods covered (including fishery products) in Retail Food Price Indexes and Consumer Price Index reflect the buying pattern of wage earners and clerical workers in 1960-61 and for the first time include single person families. Series are linked at December 1963.

Rhode Island

FISHERY LANDINGS, 1964:

Landings of fish and shellfish at Rhode Island ports during 1964 were 36.4 million pounds valued at $3.6 million. Compared with 1963, this was a drop of 32.9 million pounds and $507,000. The catch used for food was down 2.7 million; and that for industrial purposes, principally fish meal, dropped 30.2 million pounds.

During 1964, scup led all edible items with 8.7 million pounds. Yellowtail and blackback flounders were next with 8.2 and 4.1 million pounds, respectively. Whiting was third with 3.9 million pounds, followed by butterfish with 2.7 million pounds, and hard clams with 1.8 million pounds of meats. Eighty-one percent of the year's total was made up of these 6 varieties of fish and shellfish.



Rhode Island landings, 1964 and 1963.

The majority of the 1964 catch was taken by otter trawlers--25.2 million pounds or 69 percent of the year's total. Floating traps took 8.8 million pounds or 24 percent, tongs and rakes took 1.5 million pounds or 4 percent, and various other types of gear caught 900,000 pounds or 3 percent.

May landings of 8.1 million pounds were highest--68 percent was scup, or 5.5 million pounds. June was second in production with 4.6 million pounds, and July third with 3.5 million pounds.

Salmon

U. S. PACIFIC COAST
CANNED STOCKS, JUNE 1, 1965:

On June 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 951,644 standard cases (48 1-lb. cans), 199,236 cases less than on May 1, 1965, when stocks were 284,865 cases less than on April 1, 1965.

On the basis of a total of 1,131,940 actual cases (consisting of cans of $\frac{1}{4}$-lb., $\frac{1}{2}$-lb., 1-lb., etc.), pink salmon accounted for 45.6 percent (515,796 cases of which 416,225 cases were 1-lb. talls) of the total canners' stocks on June 1, 1965. Next came chum (331,956 cases, mostly 1-lb. talls), followed by red (180,128 cases). The remainder of about 9.2 percent was coho (silver) and king salmon. Pink salmon stocks on hand packed in 48 1-lb. cans accounted for 80.7 percent of the total pink salmon stocks as of June 1, 1965, with the balance mostly in 48 $\frac{1}{2}$-lb. cans.

Table 1 - Total Canners' Stocks of Pacific Canned Salmon, June 1, 1965

Species	June 1, 1965	May 1, 1965	Apr. 1, 1965
	(No. of Actual Cases)		
King	30,336	39,645	46,882
Red	180,128	227,847	299,277
Coho	73,724	87,255	102,233
Pink	515,796	654,421	849,663
Chum	331,956	373,892	428,803
Total	1,131,940	1,383,060	1,726,858

From May 1 to June 1, 1965, pink salmon stocks were lower by 138,625 actual cases (1-lb. talls lower by 103,218 cases), reds were down 47,719 cases, and chums were down 41,936 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,992,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Table 2 - Total Canners' Stocks on Hand June 1, 1965 (Sold and Unsold), by Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 ¼-lb.	2,599	42,630	14,309	1,870	21	61,429
48 ½-lb.	24,154	101,383	13,403	92,327	37,182	268,449
48 1-lb.	3,496	36,092	43,935	416,225	284,073	783,821
12 4-lb.	87	23	2,077	5,374	10,680	18,241
Total	30,336	180,128	73,724	515,796	331,956	1,131,940

Table 3 - Canners' Shipments from July 1, 1964 to June 1, 1965, by Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 ¼-lb.	21,648	385,302	108,383	9,811	1,423	526,567
48 ½-lb.	112,688	585,711	40,972	511,141	120,909	1,371,421
48 1-lb.	18,625	461,962	124,574	1,981,699	594,534	3,181,394
12 4-lb.	329	4,927	19,413	94,023	28,862	147,554
Total	153,290	1,437,902	293,342	2,596,674	745,728	5,226,936

Shipments during May 1965 totaled 199,236 standard cases. Shipments at the canners' level of all salmon species from July 1, 1964, to June 1, 1965, totaled 4,146,300 standard cases.

The new 1965 season Alaska salmon pack totaled 103,755 standard cases as of June 20, 1965. This compared with 65,650 cases on June 21, 1964. Most of the new pack consisted of red and king salmon packed at canneries in central and western Alaska.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 96 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, June 29, 1965.)

Based on data submitted to the U. S. Bureau of the Census by a sample of wholesalers and warehouses of retail multiunit organizations, distributors stocks of salmon, measured in the survey for the first time, were estimated at 671,000 actual cases on June 1, 1965.

Shrimp

U. S. PRODUCTION OF MANUFACTURED SHRIMP PRODUCTS, 1964:

The United States production of frozen breaded (raw and cooked) shrimp in 1964

Fig. 1 - Packing heads-off fresh shrimp in consumer packages for freezing in a Florida plant.

Fig. 2 - Breading peeled and deveined shrimp at a Tampa, Fla., shrimp-processing plant. This method of processing shrimp for the convenience of the consumer has increased in importance in recent years.

Fig. 3 - Conveyor belt transports shrimp to weighing and packing line.

U. S. Production of Manufactured Shrimp Products, 1954-1964

Year	Fresh and Frozen					
	Raw, Headless		Peeled, Raw (Including Deveined)		Cooked (Including Peeled & Deveined)	
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
1964. . .	1/	1/	1/	1/	1/	1/
1963. . .	66,441	47,687	22,155	25,711	2,322	3,750
1962. . .	51,177	47,214	18,129	22,032	3,139	5,401
1961. . .	46,417	35,262	17,236	18,303	2,593	4,021
1960. . .	78,071	47,636	19,287	18,500	2,871	4,281
1959. . .	61,598	36,980	11,096	9,945	1,891	2,816
1958. . .	63,276	48,214	7,622	8,450	2,080	3,405
1957. . .	58,269	45,070	9,375	9,952	1,444	2,488
1956. . .	61,355	42,633	7,512	7,304	2,237	3,101
1955. . .	69,122	39,690	6,745	5,895	1,758	1,798
1954. . .	82,416	43,115	4,156	2,605	1,607	2,056

Year	Breaded (Raw and Cooked)		Specialties (Soups, Stews, Sticks, etc.)		Total Fresh and Frozen	
1964 2/.	90,678	63,041	1/	1/	1/	1/
1963. . .	76,216	53,527	5,101	4,151	172,235	134,826
1962. . .	76,803	62,230	5,514	4,583	154,761	141,460
1961. . .	73,795	55,089	5,743	4,413	145,783	117,088
1960. . .	70,348	47,015	5,829	4,102	176,405	121,534
1959. . .	69,764	45,314	3,635	2,693	147,985	97,748
1958. . .	60,865	43,622	3,664	2,938	137,507	106,628
1957. . .	51,085	37,764	3,555	2,858	123,727	98,133
1956. . .	50,888	37,301	2,907	1,688	124,899	92,027
1955. . .	38,991	26,907	1,657	1,252	118,274	75,543
1954. . .	24,802	17,579	524	460	113,504	65,814

Year	Canned				Sun-dried	
	Natural (Drained Weight)		Specialties (Soups, Stews, etc.)			
1964 2/.	9,740	12,917	587	246	1/	1/
1963. . .	15,904	19,531	423	201	454	380
1962. . .	13,249	18,973	264	172	372	598
1961. . .	9,284	11,742	289	120	418	745
1960. . .	14,268	17,233	201	61	710	796
1959. . .	13,832	16,948	178	51	322	291
1958. . .	14,308	20,791	246	94	349	494
1957. . .	9,120	13,136	394	159	347	561
1956. . .	13,636	16,421	571	336	471	607
1955. . .	13,516	13,562	287	116	498	416
1954. . .	14,021	13,691	305	101	985	597

Year	Cured (Salted, Pickled and Smoked)		Meal and Bran		Grand Total
1964 2/.	1/	1/	754	15	1/
1963. . .	1/	1/	494	16	154,954
1962. . .	1/	1/	596	17	161,219
1961. . .	-	-	592	11	129,706
1960. . .	1/	1/	358	10	139,634
1959. . .	12	24	1,254	39	115,101
1958. . .	57	92	1,162	30	128,129
1957. . .	76	102	808	23	112,115
1956. . .	37	56	1,122	34	109,482
1955. . .	69	74	1,036	34	89,746
1954. . .	6	14	1,770	51	80,268

1/Data not available.
2/Preliminary.

amounted to 90.7 million pounds valued at a little more than $63 million. This was an increase of 19.0 percent in quantity and 17.8 percent in value as compared with 1963. The canned shrimp pack (drained weight) for 1964 dropped sharply, however, to 9.7 million pounds valued at $12.9 million--down 38.8 percent in quantity and 33.9 percent in value from 1963. There was some increase over the previous year in the 1964 production of shrimp specialties (soups, stews, etc.).

Shrimp Association of the Americas

CONVENTION HELD AT MIAMI BEACH IN JUNE 1965:

A convention was held in Miami Beach, Fla., June 20-23, 1965, jointly by the Shrimp Association of the Americas and the Southeastern Fisheries Association.

The General Session of the Convention on June 21 opened with an inaugural address by the U. S. Assistant Secretary of the Interior for Fish and Wildlife. The Session also included the following talks: "Marketing Seafood at the National Level and Highlights of the Joint Marketing Program in Florida"; "What's Going on in the Latin America Area"; and "Use of Radiotelephones by Fishing Vessels."

One of the highlights of the General Session on June 22 was a talk on the "SAOTA Advertising and Promotion Program," by the Publicity Director of the National Fisheries Institute, Washington, D. C.

The General Session on June 23, featured talks by scientists on subjects of general interest including: "A Scientific Basis for Extending the Grade 'A' Life of Fresh Iced Shrimp"; "A Proposed Program for Retaining Seafood Quality During Processing, Packing, and Distribution"; "Resume of Marine Biology Research in Mexico"; and "A Mid-Year Review of the Situation and Outlook for Shrimp." The Session also featured a "Report on Congress--Fishery Legislation" by the Director of the Fishery Products Program, National Canners Association, Washington, D. C.

States' Legislation

ACTIONS AFFECTING FISHERIES:

Following is a list of 1965 State laws and resolutions passed by the State Legislatures which have already adjourned for the year. Additional legislation will be reported as sessions end in other States. (Information Letter, National Canners Association, June 5, 1965.)

Alaska: S. 1 requires that a primary buyer "shall purchase raw fish by the pound."

S. 112 relates to the stabilization, maintenance, quality control, and development of the shellfish industry of the State. It also creates the Alaska Shellfish Marketing and Quality Control Advisory Board and provides for an assessment on shellfish processors in the State to finance the Act.

S.J.R. 46 calls for a national Department of Fisheries in the Executive Branch of the Federal Government.

S.J.R. 48 requests full appropriation support for the Commercial Fisheries Research and Development Act of 1964.

Maryland: H. 32 requires licensing of certain persons engaged in the business of buying oysters from persons taking or catching oysters; also requires licenses for certain oyster boats, vessels, and vehicles; fixes the terms and fees of such licenses; and changes license fees for the taking of oysters by tonging or dredging.

S. 464 changes laws on issuing and suspending licenses of canneries and frozen food-processing plants.

S.J.R. 32 requests the Governor to appoint a commission to study problems of the oyster industry in order to insure its survival and growth.

Tuna

FIRST PACIFIC ALBACORE OF 1965 SEASON CAUGHT OFF CALIFORNIA:

The first albacore tuna of the 1965 Pacific season were caught off southern California by the U. S. Bureau of Commercial Fisheries chartered vessel Native Sun. The vessel caught 2 albacore on June 20 and another 2 on the 21st. The catches were made at 30°41' North latitude and 121°02' West longitude, about 60 miles WNW. of Showboat Bank in a water temperature of 61.3° F.

Another chartered vessel, the Tuna Clipper, operating on June 20 at 32°18' North latitude and 121°25' West longitude in a water temperature of 59.5° F., made no catches.

Later, a U. S. Navy picket vessel was reported to have caught 2 albacore on each day during June 25-27, west of Cape Mendocino off the Northern California coast in water temperatures of 60°-62° F., at 40°30' North latitude and 133°30' West longitude. The fish were said to range from 16 to 20 pounds each.

U. S. Fishing Vessels

DOCUMENTS ISSUED AND CANCELLED:

January 1965: During January 1965 a total of 26 vessels of 5 net tons and over was issued first documents as fishing craft as compared with 33 in January 1964. There were 27 documents cancelled for fishing vessels in January 1965 as compared with 32 in January 1964.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, January 1965 with Comparisons

Area (Home Port)	January 1965	January 1964	Total 1964
	. . . .(Number). . . .		
Issued first documents 2/:			
New England	3	1	33
Middle Atlantic	1	1	11
Chesapeake	4	5	39
South Atlantic	3	5	50
Gulf	9	17	221
Pacific	6	3	141
Great Lakes	-	1	4
Hawaii	-	-	2
Puerto Rico	-	-	2
Total	26	33	503
Removed from documentation 3/:			
New England	1	1	53
Middle Atlantic	1	2	27
Chesapeake	1	4	29
South Atlantic	7	4	62
Gulf	6	9	106
Pacific	8	7	151
Great Lakes	2	5	14
Hawaii	1	-	-
Total	27	32	442

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/There were 2 redocumented vessels in January 1965 previously removed from the records. Vessels issued first documents as fishing craft were built: 6 in 1965; 11 in 1964; 1 in 1963; 1 in 1962; 1 in 1959; 1 in 1958; and 5 prior to 1951.
3/Includes vessels reported lost, abandoned, forfeited, sold, alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, January 1965 1/

Length in feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
28	-	-	-	1	1	2	4
29	-	-	-	-	1	-	1
32	-	-	-	-	-	1	1
33	-	-	-	-	1	1	2
34	-	-	1	-	1	-	2
36	-	-	-	-	1	-	1
37	-	-	1	-	-	1	2
40	-	-	1	-	-	-	1
41	-	-	1	-	-	-	1
64	-	-	-	-	1	-	1
65	-	1	-	-	1	-	2
66	-	-	-	-	2	-	2
67	-	-	-	2	-	-	2
80	1	-	-	-	-	-	1
84	1	-	-	-	-	-	1
88	1	-	-	-	-	-	1
110	-	-	-	-	-	1	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, January 1965 1/

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
5-9	-	-	3	1	2	-	6
10-19	-	-	1	-	3	5	9
60-69	-	-	-	-	1	-	1
80-89	-	-	-	-	3	-	3
90-99	-	-	-	1	-	-	1
100-109	-	1	-	1	-	-	2
130-139	1	-	-	-	-	-	1
140-149	1	-	-	-	-	-	1
170-179	1	-	-	-	-	-	1
210-219	-	-	-	-	-	1	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, January 1965 1/

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
105	-	-	-	-	1	-	1
130-139	-	-	1	-	1	2	4
165	-	-	-	-	-	1	1
200	-	-	-	-	1	-	1
218	-	-	-	-	1	-	1
220-229	-	-	1	-	2	1	4
280	-	-	-	-	-	1	1
290	-	-	1	-	-	-	1
300	-	-	-	2	1	1	4
325	-	1	-	-	-	-	1
330	-	-	-	-	1	-	1
350	-	-	-	1	-	-	1
370	-	-	1	-	-	-	1
390	-	-	-	-	1	-	1
510	1	-	-	-	-	-	1
680	1	-	-	-	-	-	1
760	1	-	-	-	-	-	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

* * * * *

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, APRIL 1-JUNE 30, 1965:

From the beginning of the program in 1956 through June 30, 1965, a total of 1,644 applications for $42,734,194 was received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 865 applications ($19,206,671) had been approved, 546 ($12,884,077) had been declined or found ineligible, 205 ($7,859,792) had been withdrawn by the applicants before being processed, and 28 ($758,522) were pending. Of the applications approved, 323 were approved for amounts less than applied for--the total reduction was $2,025,132.

The following loans were approved from April 1 through June 30, 1965:

New England Area: David A. MacVane, Jr., Cliff Island, $5,000; Colby A. Young, Corea, $2,800; Dorothy Dodge, East Boothbay, $1,200; Michael W. Hudlin, West Southport, $2,500; all in Maine.

Pacific Northwest Area: Leonard Botten, Dockton, Wash., $14,842; Richard A. Eastman, Jr., Roseburg, Oreg., $10,000; Stanley E. Pedersen, Seattle, Wash., $5,000; Antone F. Mariani, Tacoma, Wash., $20,000.

Alaska: G. Gale Allen, Cordova, $4,500; Ronald K. Sparks, Haines, $3,000; Grant Fritz, Jr., Kasilof, $2,400; William B. Cuthbert, Kodiak, $104,000; Kodiak Bait Company, Kodiak, $8,885; Oliver and Sarah A. Hofstad, Petersburg, $15,000; Lloyd E. Pederson, Petersburg, $10,000; Grady Lee Hamrick, Seldovia, $15,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the second quarter of 1965, a total of 5 applications for $227,244 was received. Since the program began (July 5, 1960), 77 applications were received for $7,469,992. Of the total, 63 applications were approved for $4,850,967, and 7 applications for $1,932,342 were pending as of June 30, 1965. Since the mortgage insurance program began, applications received and approved by area are:

New England Area: Received 13 ($1,464,500), approved 9 ($1,034,928).

California: Received 2 ($1,262,000), approved 2 ($1,262,000).

South Atlantic and Gulf Area: Received 49 ($2,806,646), approved 43 ($1,962,969).

Pacific Northwest Area: Received 8 ($1,861,250), approved 5 ($526,296).

Alaska: Received 5 ($75,596), approved 4 ($64,774).

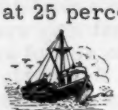
The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through June 30, 1965, a total of 39 applications for $8,112,500 had been received. Public hearings on 18 applications were held during that period and 4 invitations to bid on a vessel were released. The first subsidy contract and construction contract for construction of a vessel under this program were completed on June 30, 1965.

U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 29, 1965, amounted to 12,187,083 pounds (about 580,337 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a decline of 16 percent from the 14,496,778 pounds (about 690,320 standard cases) imported during January 1-May 30, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JUNE 1965:

Higher wholesale prices for most fresh finfish species in June 1965 than in the previous month were more than offset by a drop in fresh and frozen shrimp prices. At 108.9 percent of the 1957-59 average, the overall index for edible fishery products (fresh, frozen, and canned) was down 0.3 percent from May to June, but was 3.1 percent higher than in June 1964.

Freezing consumer-packaged scallop meats by a New Bedford firm.

The subgroup index for drawn, dressed, or whole finfish was up 6.8 percent from May to June because of higher prices for most items: Boston prices for ex-vessel large haddock were up 19.2 percent; New York City prices for seasonal supplies of western fresh halibut were up 8.0 percent and of salmon up 5.3 percent; and Chicago prices for Lake Superior whitefish were up 6.0 percent. The exception, Great Lakes round yellow pike prices were down 15.3 percent. As compared with June 1964, the subgroup index this June was higher by 6.6 percent--prices were up from a year earlier for all items except salmon: by 17.3 percent for large haddock; by 20.9 percent for western fresh halibut; and by 44.8 percent for Lake Superior whitefish. Supplies of western fresh halibut this June were especially light, with market conditions strong.

Prices at New York City for South Atlantic fresh shrimp were sharply lower (down 16 cents a pound at wholesale) from May to June due to increased production. Although June prices were higher at Boston for fresh haddock fillets (up 7.5 percent), the subgroup index for processed fresh fish and shellfish was down 7.8 percent from the previous month due solely to the lower prices for shrimp. As compared with June 1964, the subgroup index

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1965 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			June 1965	May 1965	June 1965	May 1965	Apr. 1965	June 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.9	109.2	108.8	105.6
Fresh & Frozen Fishery Products:					111.5	112.9	113.3	107.8
Drawn, Dressed, or Whole Finfish:					113.3	106.1	111.0	106.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.10	88.2	74.0	69.5	75.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.41	129.4	119.8	119.8	107.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.87	.83	121.4	115.3	115.3	124.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.62	.58	91.8	86.6	126.9	63.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.55	.65	90.1	106.4	163.7	69.6
Processed, Fresh (Fish & Shellfish):					109.6	118.9	114.5	114.8
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.36	.33	86.2	80.2	85.0	77.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.89	1.05	104.3	123.0	117.2	117.2
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.2	120.2	115.9	118.0
Processed, Frozen (Fish & Shellfish):					106.6	109.4	109.5	98.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.8	98.8	93.8	92.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.38	108.5	109.9	108.5	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	105.2	105.2	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.89	.93	105.5	109.7	111.5	96.6
Canned Fishery Products:					104.9	103.0	101.2	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.00	21.00	95.9	91.5	88.3	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	101.6	102.1
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	113.0

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

this June was down 4.5 percent--lower shrimp prices (down 11.0 percent) alone were again responsible for the decline.

The June 1965 subgroup index for processed frozen fish and shellfish was down 2.6 percent from the previous month. June prices were lower at Chicago for frozen shrimp (down 3.8 percent) and at Boston for frozen haddock fillets (down 1.3 percent); for other items in the subgroup there was no change. But prices this June were higher than in the same month a year earlier with the subgroup index up 8.0 percent. Frozen ocean perch fillets were at the same price level in each of the months shown.

The June 1965 index for canned fishery products rose 1.8 percent from the previous month (the same percentage increase as from April to May). The market outlook for canned pink salmon continued good in June, with prices up 4.8 percent from the previous month; but prices for other canned fishery products were unchanged. The subgroup index this June was up 2.6 percent from the same month in 1964--prices were higher for all canned fish except salmon (down 1.1 percent).

Youth Opportunity Campaign

FISHING INDUSTRY CAN HELP:

This summer more than 2 million American boys and girls, 16 through 21 years of age, will enter the work force. About half of that number will be seeking permanent jobs, and a start toward useful and productive participation in the economic growth of America. The balance seek temporary jobs. For the latter there is a twofold objective--first to earn money that may spell the difference between return to school and permanent dropout; and second, this early realistic exposure to orderly work patterns may materially help in more effective orientation of their formal training upon return to the classroom.

President Johnson has asked that all segments of our economy--Federal, State, and

local agencies; private firms and other organizations--make a special effort to help in this Youth Opportunity Campaign. For example, at least 620,000 firms employ from 10 to 100 workers. If each of these employed one summer trainee per 100 workers substantial progress could be made toward meaningful work opportunities. On the Federal sector, we have been asked to apply the same ratio of one summer employee for 100 regulars.

These work opportunities should be over and above those that would normally be offered, and not in lieu of regular employment. The intent is to increase the work force, provide new employment, and expose these summer trainees to work experiences of value in selection of their future careers.

Our fishing industry has an opportunity to inject new, vigorous blood into its structure through participation in this campaign. Much of the work is seasonal in nature, lending itself to use of these summer trainees. Also, in many parts of the country, it has been difficult to interest youths in fisheries as a possible career. If we seize this chance to expose an even larger group this year, there is a mathematical probability our "catch" in this contest for the best talent will be greater. How about it? Can you help your company by participating? If so, contact your nearest State Employment office, giving details on the type and number of training opportunities available.

SALMON OVERCOMES OBSTACLES TO GO HOME

An amazing story about the determined spirit of a Pacific salmon has come to light in California. A salmon, named "Indomitable," has accomplished one of the most phenomenal migrations ever recorded.

Early in 1964, the salmon (then 1.5 years old) was taken from his tank in the hatchery at Orick, Calif., marked by removal of a fin, and placed in a stream some miles distant. This year, the fish made its way back to the hatchery from the Pacific through one of the most difficult obstacle courses ever constructed.

"Indomitable" swam up two creeks, through a culvert under U. S. highway 101, and into a 4-inch drain pipe with a 90-degree turn. Then the fish had to leap through a $2\frac{1}{2}$-foot high pipe and over a 2-foot high wire net. At one point, the salmon had a choice of 5 pipes, 4 of which were dead-ends.

Who said there are no more big fish stories?

SCANDINAVIAN FISH-TAGGING METHOD BEING TRIED BY U. S. FISH HATCHERY

A method of tagging used extensively in the Scandinavian countries is being tried on trout by the Federal Fish Hatchery at Cortland, N. Y. Very small plastic discs are attached to the fish by means of stainless steel wire put through the neural spines just anterior to the dorsal fin. After attachment, the discs usually lie alongside the dorsal fin and apparently offer little restriction to movement of the fish. The flesh of the fish is very tolerant to the stainless steel wire, growing around and adhering to it very firmly. (The Progressive Fish-Culturist, July 1964.)

FOREIGN

International

EUROPEAN FREE TRADE ASSOCIATION

MINISTERIAL MEETING IN VIENNA REVIEWS POLICY:

The Council of the European Free Trade Association (EFTA) met at the Ministerial level in Vienna on May 24, 1965. The Ministers examined the situation as it exists today in Europe, after 5 years of successful development of EFTA. They discussed the likely consequences for Europe of the deepening division resulting from the continued separate evolution of EFTA and the European Common Market (EEC). The Ministers considered that a hardening of the division could only be arrested by new initiatives. They agreed that it would be desirable to seek to arrange meetings at the Ministerial level between the two groups at the earliest opportunity which offered prospects of a fruitful result.

The Ministers reaffirmed their determination to intensify cooperation within EFTA in order to ensure the prosperity of its own members and to offer the best prospect of achieving a satisfactory basis for closer collaboration between the Association and the European Common Market. They accordingly instructed the EFTA Council at the official level to examine the further progress to be made in EFTA with that in view and to report to the Ministers in time for their next meeting, which is scheduled to be held in Copenhagen in October 1965. The Council report is to deal in the first place with the internal arrangements of EFTA, including the Economic Development Committee, with due regard to the EFTA objectives of the Association concerning agriculture and fisheries as set out in Article 2 and Articles 22 and 27 (Article 27 specifically deals with the objectives for trade in fish and other marine products). Second, the report is to cover the external aspect of EFTA activities, taking into account the arrangements proposed for joint discussions with the EEC. The Council was also instructed to review the institutional arrangements of EFTA. (European Free Trade Association, Information Office, Washington, D. C. May 24, 1965.)

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-MARCH 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland,

Table 1 - Exports of Fish Meal by Member Countries of the FEO, Jan.-Mar. 1965

Country	March		Jan.-Mar.	
	1965	1964	1965	1964
	. . . .(1,000 Metric Tons). . . .			
Chile	15.9	17.2	31.1	42.9
Angola	4.2	6.6	16.3	13.4
Iceland	11.7	11.7	27.3	31.7
Norway	16.7	13.0	42.5	53.7
Peru	169.8	186.1	464.8	388.7
So. Africa (including S.-W. Africa)	26.5	20.0	42.4	44.6
Total	244.8	254.6	624.4	575.0

Table 2 - Production of Fish Meal by Member Countries of the FEO, Jan.-Mar. 1965

Country	March		Jan.-Mar.	
	1965	1964	1965	1964
	. . .(1,000 Metric Tons). . . .			
Chile	10.1	4.3	33.8	47.4
Angola	2.6	5.3	13.3	14.9
Iceland	13.7	8.8	22.8	21.0
Norway	31.4	28.2	56.0	43.2
Peru	191.9	175.2	508.3	495.9
So. Africa (including S.-W. Africa)	43.0	33.4	74.3	63.8
Total	292.7	255.2	708.5	686.2

International (Contd.):

Norway, Peru, and South Africa/South-West Africa.

Peru accounted for about 74 percent of the 624,400 metric tons of fish meal exported by FEO countries in January-March 1965.

* * * * *

WORLD PRODUCTION, APRIL 1965 WITH COMPARISONS:

World fish meal production in April 1965 was down about 21 percent from the previous month due mainly to a decline in Peruvian output.

World fish meal production in January-April 1965 was about the same as that in the first 4 months of 1964. Peru accounted for about 61 percent of total output in January-April 1965.

World Fish Meal Production by Countries, April 1965 with Comparisons

Country	April		March		Jan.-Apr.	
	1965	1964	1965	1964	1965	1964
	(Metric Tons)					
Canada	2,065	1,460	7,154	4,227	23,893	12,460
Denmark	7,473	6,591	8,434	3,810	30,723	21,608
France	1,100	1,100	1,100	1,100	4,400	4,400
German Fed. Rep.	5,726	6,736	6,123	6,388	22,027	26,271
Netherlands	542	500	1/	600	1,704	2,500
Spain	2,321	1/	1/	1/	10,038	1/
Sweden	782	885	1,001	527	3,440	2,897
United Kingdom	6,785	7,217	6,751	6,438	28,572	28,345
United States	9,876	6,438	2,501	2,027	16,776	11,847
Angola	2,314	2,753	2,654	5,296	15,571	17,633
Iceland	4,364	10,094	13,681	8,771	37,232	31,122
Norway	23,230	31 582	31,372	28,221	79,210	74,820
Peru	149,911	158,505	191,930	175,170	658,230	654,442
So. Afr. (including S.-W. Afr.)	37,635	31,543	43,091	34,188	112,182	96,980
Belgium	375	375	375	375	1,500	1,500
Chile	3,695	13,343	10,062	4,291	37,502	60,752
Morocco	300	350	1/	700	600	1,910
Total	258,514	279,472	326,229	282,129	1,073,600	1,049,487

1/Data not available.
Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in March 1965 was up about 51 percent from the previous month due to a sharp increase in Peruvian output and rising production in South Africa, Norway, and Iceland.

World fish meal production in January-March 1965 was up slightly from that in the first 3 months of 1964. Peru accounted for about 63 percent of total output in the first quarter of 1965. Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

FISH OIL

WORLD EXPORTS, 1964:

World gross exports of fish oil (including fish-liver oil) continued at a record level in 1964.

Peru, the United States, Iceland, and the Republic of South Africa are the most important world suppliers of fish oil, accounting for nearly 75 percent of the world's gross exports and about 95 percent of the world's net exports of fish oil in 1963-64. Although several European countries export sizable quantities of fish oil, the area as a whole is a net importer and takes most of the world's exports of fish oil. Much of the domestic production of fish oil in Europe is retained for domestic consumption, normally in the country of origin, or exported to other European countries as in the case of Iceland, Portugal, West Germany, and Denmark. In addition, Norway, West Germany, and the Netherlands import large quantities of fish oil for further processing and export largely to other European countries.

World Gross Exports of Fish Oil (Including Fish Liver Oils)1/, Annual 1959-64 and 5-Year Average 1955-59

Continent and Country	2/1964	1963	1962	1961	1960	1959	Average 1955-59
	(1,000 Short Tons)						
North America:							
Canada	15.8	6.4	3.2	4.4	15.2	14.8	8.5
Mexico	0.3	0.2	0.3	0.8	3/	0.7	0.7
United States	75.7	131.2	61.5	61.2	71.8	72.2	64.1
Total No. America	91.8	137.8	65.0	66.4	87.0	87.7	73.3
South America:							
Argentina	0.5	0.5	0.4	0.6	1.0	0.4	0.5
Chile	15.1	12.7	12.0	5.1	6.6	0.1	4/0.1
Peru	147.3	121.3	166.0	112.8	38.6	18.9	5.5
Tota' So. America	162.9	134.5	178.4	118.5	46.2	19.4	6.0
Europe:							
Denmark	33.5	22.9	16.8	10.5	7.4	16.1	12.5
France	3.2	4.0	2.8	2.7	2.4	1.6	1.1
West Germany	16.2	19.7	22.9	25.3	26.2	31.6	17.9
Iceland	68.6	71.2	72.5	35.2	54.5	18.9	21.1
Netherlands5/ & 6/	2.7	2.8	2.6	5.2	7.8	16.0	10.4
Norway6/	22.3	21.2	18.6	24.0	18.4	21.8	21.3
Portugal	7.5	10.5	6.7	7.4	4.9	5.7	5.1
Sweden	3.0	3.4	2.0	3.4	2.5	3.0	2.5
United Kingdom	2.2	2.7	2.6	3.2	3.7	3.7	3.8
Other Countries (incl. U.S.S.R.)7/	2.8	2.6	2.9	2.8	2.0	2.3	1.7
Total Europe	162.0	161.0	150.4	119.7	129.8	120.7	97.4
Africa:							
Angola	8.1	3.4	2.9	3.3	7.3	5.6	8.1
Morocco	5.8	5.7	4.9	4.5	5.7	4.3	2.7
South Africa Republic8/	49.2	35.3	50.4	50.3	37.4	26.6	15.2
Total Africa	63.1	44.4	58.2	58.1	50.4	36.5	26.0
Asia and Oceania:							
Japan	2.3	2.0	3.2	2.7	3.8	3.6	5.8
Other Countries7/	0.8	0.8	0.7	0.8	1.0	1.7	1.2
Total Asia and Oceania	3.1	2.8	3.9	3.5	4.8	5.3	7.0
World total	482.9	480.5	455.9	366.2	318.2	269.6	209.7

1/Hardened fish oils have been included wherever separately classified in export statistics.
2/Preliminary.
3/Under 50 tons.
4/1959 only.
5/Excludes [illegible] (prior to 1960).
6/Excludes sizable quantities of hardened fish oils exported annually which are not separately classified in trade returns.
7/Includes estimates for minor exporting countries.
8/Including the territory of South-West Africa.

Exports from Peru reached a record 147,300 short tons in 1964, an increase of 21 percent from 1963. The increase enabled Peru to surpass the United States and become the leading world supplier. Exports from the Republic of South Africa, Chile, Denmark, and Canada rose, while exports from the other major suppliers, the United States and Ice-

International (Contd.):

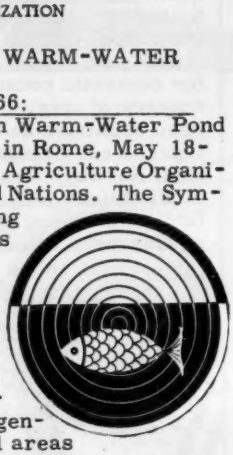
land, declined. (World Agricultural Production and Trade, U. S. Department of Agriculture, June 1965.)

Note: See Commercial Fisheries Review, Feb. 1965 p. 48, and Sept. 1964 p. 51.

FOOD AND AGRICULTURE ORGANIZATION

WORLD SYMPOSIUM ON WARM-WATER POND FISH CULTURE TO BE HELD IN MAY 1966:

A World Symposium on Warm-Water Pond Fish Culture will be held in Rome, May 18-25, 1966, by the Food and Agriculture Organization (FAO) of the United Nations. The Symposium is intended to bring together fishery scientists and technicians actively concerned with some aspect of pond-fish culture.



The important contribution that fish culture can make to the improvement of human diets and general development of rural areas is being increasingly recognized all over the world. There is a need, however, to stimulate further research in fish culture and to modernize techniques.

Since the entire field of fish culture is too wide to be covered in one meeting, the Symposium at Rome will only consider selected aspects of pond culture of warm-water species (such as carp and tilapia). Cold-water species such as salmon and trout will not be considered.

The objectives of the Symposium will be to:

(a) Evaluate warm-water pond-fish culture development in different regions of the world.

(b) Review the present status of knowledge on: (1) the role of soil in productivity; (2) fertilization of ponds; (3) feeds and feeding; (4) control of pond weeds; (5) stock manipulation and other biological methods of increasing production; (6) breeding and selection (including induced breeding and induced sterility); (7) new systems and new fish for culture; and (8) diseases and parasites of pond fish.

(c) Delineate major problems requiring solution.

(d) Consider means of stimulating critical scientific studies on pond-fish culture and coordinating research programs.

(e) Discuss and recommend future lines of endeavour, national and international, in the study and promotion of fish culture for food.

The Symposium will be held in ten consecutive meetings. Each meeting will have a discussion leader and a rapporteur. Leading workers and specialists will be invited to contribute reviews and experience papers on the selected topics, which will be duplicated and distributed in advance of each meeting. The discussion leader of each meeting will summarize the relevant papers; the subject will then be open for discussion, and the authors of papers will have the opportunity to highlight, if required, any aspect of their contribution. If the discussion on any topic indicates the need for a closer study of any particular problem, the discussion leader will appoint an informal working group and, with the rapporteur, coordinate their work. Each rapporteur will prepare a report summarizing the discussions in his meeting, including the working group reports. Their reports will be incorporated in the Report of the Symposium after general approval by the participants.

Member Governments of FAO are being invited to nominate Symposium participants with expert knowledge in the field. Several international organizations are also being invited to send participants and observers. It is understood that participants presenting papers or contributing to discussions will do so in their individual capacity; they will not be expected to commit their governments to actions or recommendations, nor in other way formally to represent their governments or the organizations which may nominate them.

The Symposium will be conducted in English, French, and Spanish; simultaneous interpretation in those languages will be provided.

Additional information about the Symposium as well as instructions for preparing manuscripts for the meeting may be obtained from Dr. T.V.R. Pillay, Secretary, FAO World Symposium on Warm-Water Pond Fish Culture,

International (Contd.):

Fisheries Division, FAO, Via delle Terme di Caracalla, Rome, Italy.

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GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

ANNUAL SESSION HELD IN ROME:

Tuna Working Party Set: A working party to study the tuna and tuna-like fish of the Mediterranean was set up by the General Fisheries Council for the Mediterranean (GFCM) at its 8th Annual Session in Rome, May 10-15, 1965.

Tuna fishing off the coast of Libya. Fish are trapped in set nets.

The purpose of the GFCM working party is to determine the size, migratory habits, distribution, growth and mortality rates, spawning grounds, and sustainable annual yield of the Mediterranean's stocks of tuna and tuna-like fish. The working party also intends to organize Mediterranean-wide tuna-tagging experiments, a basic tool for studying the population dynamics of any given species of fish. Eight nations have already agreed to provide the new working party with tuna experts. They are France, Italy, Israel, Libya, Monaco, Spain, Tunisia, and Yugoslavia.

Tuna is one of the most important commercial fish species caught in the Mediterranean. All Mediterranean fishing nations catch at least some tuna. Turkey caught 19,200 metric tons of tuna in the Mediterranean in 1963, a larger tuna catch than any of the other Mediterranean fishing nations. Italy, followed with 3,300 tons, Israel 900 tons, and Yugoslavia 300 tons. France, Morocco, and Spain have large tuna fisheries, but the bulk of their tuna catch is from the Atlantic.

Sardine-Tagging Program in Mediterranean: The first sardine-tagging program for the entire Mediterranean Sea will be initiated in 1966. The proposed program had the unanimous agreement of the 15 member nations attending the annual meeting at Rome of the General Fisheries Council for the Mediterranean. The program calls for each Mediterranean country presently fishing sardine to devote about one month to tagging some 5,000 fish each.

The sardine is of major commercial importance to the fishing nations of the Mediterranean. Tagging fish is a means for determining the growth and mortality rates, migratory routes, distribution, population dynamics, and stock sizes. The program's major aim is to revitalize the Mediterranean sardine fishing industry and to determine, through recovery of the tagged fish, how much can be caught without harming the stocks.

Other Actions: The Council also called on the Food and Agriculture Organization (FAO) for aid in drawing up a general plan for the future development of the Mediterranean's marine resources. It asked FAO to seek aid in financing such a general program through the United Nations Special Fund, the United Nations Expanded Program of Technical Assistance, and other international bodies such as the World Bank. The Council also asked FAO's help in collecting economical and statistical data on Mediterranean fisheries, and in improving Mediterranean fisheries statistical systems.

Dr. Raffaele Cusmai, Italy's Director-General of Fisheries, was elected chairman for the next GFCM biennial session, to be held in Split, Yugoslavia, in May 1967.

Member nations of the GFCM are France, Greece, Italy, Israel, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey, the United Kingdom, the United Arab Republic, and Yugoslavia. (Food and Agriculture Organization, Rome, May 12 and 17, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 56.

International (Contd.):

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA

CONVENTION ENTERS INTO FORCE:

The International Convention for the Safety of Life at Sea, 1960, done at London, June 17, 1960, entered into force May 26, 1965. The new Convention (commonly called the 1960 International Rules of the Road) was formulated by the maritime nations making up the Iter-Governmental Maritime Consultative Organization. (Department of State Bulletin, April 12, 1965.)

Note: See Commercial Fisheries Review, Feb. 1965 p. 95, and Jan. 1965 p. 103.

NORTHEAST ATLANTIC FISHERIES COMMISSION

THIRD MEETING HELD IN MOSCOW:

The Northeast Atlantic Fisheries Commission (NEAFC) held its third meeting in Moscow, May 11-14, 1965. Delegations were present from 13 of the 14 member countries--Belgium, Denmark, Federal Republic of Germany, France, Iceland, Ireland, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Soviet Union, United Kingdom. Observers were present from the United States, International Council for the Exploration of the Sea (ICES), the International Commission for the Northwest Atlantic Fisheries (ICNAF), and from the Fisheries Division of the Food and Agriculture Organization (FAO).

At the meeting in Moscow, the Northeast Atlantic Fisheries Commission agreed on the following:

1. In the part of the Convention Area south of 48° North, from January 1, 1966, for a trial period of three years: (a) the minimum size of mesh of nets applicable should be 60 millimeters (2.35 inches); (b) minimum lengths of 24 and 21 centimeters (9.44 and 8.26 inches) should be prescribed for hake and sole, respectively; and (c) the species Discoglossa (or Dicologoglossa) cuneata should be added to the list of species which may be fished for with nets containing meshes of less than the prescribed minimum size.

2. After the Special Committee on International Control, established at the Second Meeting at the Hague in 1964, reported on the results of its deliberations, the Commission resolved that Contracting States should, within the limits of their respective jurisdictions, inspect foreign vessels to ascertain whether they were complying with the Commission's recommendations and report the result of the inspection to the Flag State and the Commission. The Commission also agreed that the Committee should continue its work during the ensuing year with a view to studying the possibility of introducing a system of international inspection on the High Seas from January 1, 1967.

3. Until December 31, 1968, Contracting States could authorize use of top-side chafers which did not obstruct or otherwise affect the selectivity of the mesh in the cod end. The scientific evidence on which the authorization was based would be furnished to the Commission which could circulate the evidence to Contracting States.

4. (a) The minimum mesh size in the northern part of the Convention Area east of the Greenwich meridian, should be increased by 10 millimeters (0.3937 inches) from January 1, 1967; (b) from January 1, 1967, the minimum mesh size around the Faroe Islands, should be increased by 20 millimeters to 95 millimeters and 100 millimeters (0.787, 3.74, and 3.93 inches) and that a further increase of 10 millimeters should come into operation on January 1, 1970. The area in which those provisions would apply was defined as being that contained by a line drawn east from 10° west longitude along the parallel of 63° north latitude, to 4° W. longitude, then south to 60°30' north latitude, west to 5° west longitude, south to 60° north latitude, west to 15° west longitude, north to 62° north latitude, east to 10° west longitude and then north to 63° north latitude; (c) from January 1, 1969, the minimum sizes of fish prescribed for the northern part of the Convention Area should apply to the area around the Faroe Islands.

5. The present provisions on industrial landings should be extended until January 1, 1970.

6. The minimum size for dab (Limanda limanda) should be reduced from 20 centimeters to 15 centimeters but that annual reports showing the composition of "by-catches" of the dab fishery should be submitted.

7. Until December 31, 1968, vessels based on and landing their catches in ports in the area in the Irish Sea between the parallels of 54°30' and 53° north latitude and west of 5°15' west longitude could, for the purpose of catching whiting, carry and use nets of a minimum mesh size of 60 millimeters (2.36 inches).

International (Contd.):

8. ICES should be requested to reconvene the North Western Working Group to review the state of the fish stocks in the North West Area and in the Faroes, and to provide up-to-date assessments through the Liaison Committee and to continue the activity of the North Eastern Working Group.

9. Countries fishing for cod and other species in the Arctic should provide for the Liaison Committee more data on: (a) rate of discards made by the trawlers, together with fish used for meal; (b) length measurements of landings of commercial trawlers; (c) effective selectivity of gear in use.

10. All countries should be urged to provide to the Liaison Committee regular information on the actual cod end mesh sizes in use, as measured with the standard ICES gauge, with as much information as possible to be provided by September 1, 1965.

11. The Contracting States should be requested to continue investigations designed to obtain more precise information on the selectivity of nets of different materials with regard to appropriate differentials in the prescribed minimum meshes and to submit any fresh evidence to the Liaison Committee as soon as possible.

12. The Liaison Committee should be requested to review the mixed fisheries only at intervals of three years but the Contracting States should be requested to continue to submit annual reports on the state of their mixed fisheries.

13. The Infractions Committee should be requested to consider how the intensity of inspection can best be reflected in the statistics and to report to the Commission at its next meeting.

14. The budget for the year ending June 30, 1966, should be £4.1 million pounds sterling (US$11.5 million).

15. J.S.W. Henshaw (UK) should be appointed Secretary in place of A.K.H. Atkinson (UK), resigned.

16. The next (fourth) NEAFC meeting should be held in Edinburgh, Scotland, May 10-13, 1966. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 2, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 43; and August 1964 p. 52.

TRADE PROTOCOL

SOVIET-NORWEGIAN PACT PROVIDES FOR EXCHANGE OF FISHERY PRODUCTS:

The Soviet Union and Norway signed a 3-year Trade Protocol in Oslo on January 29, 1965. The Protocol provides for an annual export to the Soviet Union of 5,000 metric tons of frozen herring and herring fillets, 10,000 tons of frozen fish and fish fillets, and 5,000 tons of salted herring in 1965, 1966, and 1967. In addition, the Soviets will import unspecified amounts of Norwegian canned fishery products and fishing equipment.

Soviet fishery exports to Norway will consist entirely of canned king crab in the amount of 3,400 cases for each of those three years.

The Soviets agreed to accept the delivery of 5,000 tons of salted winter herring only after prolonged negotiations. The 1964 Norwegian-Soviet trade agreement provided for the delivery of 15,000 tons of salted herring to the U.S.S.R. but, because of the poor quality of 1964 Norwegian herring catches, only about 5,000 tons were actually sold. The Soviets cited the Norwegian failure to fulfill the 1964 delivery as the reason for reducing the 1965 quota.

Australia

TUNA CATCH DOWN IN 1965:

The total Australian tuna catch for 1965 was 7,525 tons, compared with the 1964 record of 8,978 tons.

Two vessels, the Ekalta and the Caroline Star, surveyed new fishing areas to the southeast of Port Lincoln as far as Portland. Their survey was made after spiny lobster fishing vessels reported tuna in the area.

In the coming 1966 season, the largest wooden fishing vessel to be built in Australia is expected to enter the tuna fishery. Under construction at a Birkenhead shipyard, the 87-foot tuna vessel is expected to cost A£85,000 (US$190,400).

Australia (Contd.):

The 1965 South Australian tuna fishing season ended in May with a total catch of 5,215 short tons, 848 tons less than in the 1964 season. The catch for April was 1,413 tons, but tapered off in the first two weeks in May when only 50 tons were landed.

As of April 15, the total tuna catch off South Australia during the 1965 season amounted to 4,706 short tons, an increase of 333 tons over the catch during the same period of the 1964 season.

In the last 2 weeks in March 1965, the South Australian tuna fleet of 22 vessels caught 1,226 tons of bluefin tuna--a record for any 2-week period since the fishery began in 1952. In February-March 1965, one of the top vessels caught 350 tons of tuna.

Operations this year have been concentrated on areas off Neptune and Rocky Islands, Coffin Bay, and Pearson Island. The Tacoma in March explored grounds farther to the west and returned after 7 days with 44 tons of tuna aboard. The Degei worked south off the Continental Shelf and caught 53 tons.

Rough weather in March and early April restricted operations by the three vessels engaged in the search for tuna on the eastern and southern coasts of Tasmania.

While searching for tuna off Tasmania, the Australian research vessel Marelda tagged 80 bluefin in a 2-week period. (Australian Fisheries Newsletter, June 1965; May 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 36, and April 1965 p. 60.

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RESULTS OF TASMANIAN TUNA SURVEY NOT UP TO EXPECTATIONS:

A progress report on operations during the first 3 months of the Tasmanian tuna survey, issued after a meeting in Hobart of the joint committee organizing the survey, said that results so far had not been particularly encouraging.

The survey in eastern Tasmanian waters, financed jointly by the Commonwealth Government from the Fisheries Development Trust Fund and the Tasmanian State Government, began on February 1, 1965. Two chartered tuna vessels and an airplane were used in an attempt to assess the prospects of developing a commercial tuna fishery in Tasmanian waters by the pole-and-live-bait method of fishing.

The weather was not particularly favorable for most of the period and the hours steamed by the vessels was slightly below expectation. Aerial spotting was conducted as planned and the research vessel Marelda of the Commonwealth Scientific and Industrial Research Organization (CSIRO) also operated as planned, collecting hydrographic information.

Sightings of bluefin tuna in the first 3 months were not extensive enough to justify commercial operations. But quantities of striped tuna, sufficiently large to encourage gill-net fishing were sighted.

Officers of the Division of Fisheries and Oceanography of CSIRO, who are responsible for the technical direction of the survey, advised that the results of the survey must be examined in conjunction with environmental conditions found.

The 65° F. isotherm did not advance further south than Cape Barron and it was only in that region that bluefin tuna were poled. All bluefin tuna taken further south were caught on trolling lines. This pattern of behavior is consistent with bluefin behavior in other areas, and indicates that a bluefin tuna fishery in eastern Tasmanian waters would be regulated by the annual intrusion of warmer water from the north in summer. The depth of this intrusion varies from year to year.

Since the report was issued, a Victorian shark fisherman reported passing through shoals of tuna off Sandy Cape, on the West Coast of Tasmania. An aerial search under good conditions found only a dozen bluefin tuna in the area. Acres of striped tuna were seen in Bass Strait, off Flinders Island.

A spotting airplane in mid-May spotted a number of schools of bluefin and striped tuna off the southern coast of the island, and some were estimated to contain 5 tons of fish. However, the tuna were feeding, and appeared only briefly on the surface and could not be poled. (Australian Fisheries Newsletter, June 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 51.

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Australia (Contd.):

NEW SMOKED TUNA PRODUCT INTRODUCED:

A new fishery product--smoked pressed tuna--is being marketed in Australia by the South Australian Fishermen's Cooperative.

The cooked smoked tuna will be available as a 5-pound loaf, or in slices, and is expected to sell at retail for about 8½ Australian shillings (about 95 U. S. cents) a pound. Fresh and chilled it can be used for sandwiches, with salads, and with smorgasbords. (Australian Fisheries Newsletter, June 1965.)

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SCALLOP AND SHRIMP FISHERY TRENDS, EARLY 1965:

Scallops: During the 9-months period ending March 31, 1965, scallop landings in the State of Victoria amounted to 149,000 bags with a total ex-vessel value of A£245,699 (US$546,680). In March 1965, there were 51 vessels fishing for scallops off Victoria. In April 1965, prices for scallop meats reached 2s. 6d. (27.5 U. S. cents a pound), the highest level of the 1964/65 season which began July 1, 1964.

In mid-May 1965 in the State of Tasmania, 10 vessels were fishing on the east coast, and catches of up to 60 bags of scallops a day were reported from the Bicheno area.

Shrimp: In Western Australia, it has been reported that the number of vessels to be licensed to fish for shrimp in Exmouth Gulf will be limited to 15 during 1965 and 1966. (Australian Fisheries Newsletter, June 1965.)

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FISHERY PRODUCTS EXPORTS UP IN FISCAL YEAR 1964/65:

If trends for the first 9 months of fiscal year 1964/65 (July 1964 to June 1965) were to continue, Australian marine exports for that year could total A£10 million (US$22.4 million) for the first time.

Trends in Australian Marine Export Markets published by the Fisheries Branch of the Australian Department of Primary Industry showed that for the 9 months ended March 31, 1965, exports were valued at $15.2 million, an increase of 23.1 percent as compared with the same period in 1963/64.

Frozen spiny lobster tails remain the most valuable item; exports for the 9 months being valued at $9.3 million compared with $8.4 million in the corresponding period in 1963/64. The March 1965 exports valued at $1.9 million were nearly double those for March 1964.

The total quantity of spiny lobster tails exported for the 9 months ended March 31, 1965, were 4.8 million pounds as compared with 6.4 million pounds in the same period in 1963/64, but the drop in quantity was more than compensated for by record prices prevailing in the United States market. Prices paid in New York City in March 1965 for 10-12 oz. Australian spiny lobster tails ranged from $2.40 to $2.42 a pound, compared with $1.70 to $1.75 in the same month of 1964.

Australia's shrimp exports for March 1965 were at their highest level since September 1964. Most of the shrimp exports during the month went to South Africa and Japan. A total of 1.8 million pounds valued at $1.6 million was exported in the 9 months ended March 31, 1965, compared with 771,000 pounds valued at $759,000 for the same period in 1963/64.

About 39,000 pounds of tuna valued at $4,500 was exported to Japan and Italy during March 1965, bringing the total tuna exports for the 9 months ended March 31, 1965, to 776,000 pounds valued at $105,000.

Australia's exports of scallops in the first 9 months of fiscal year 1964/65 totaled 1.4 million pounds valued at about $800,000. Of that total, about 1 million pounds valued at close to $600,000 went to France, with shipments also to the United States market. (Australian Fisheries Newsletter, June 1965.)

Notes: (1) Values converted at rate of A£1 equals US$2.24.
(2) See Commercial Fisheries Review, March 1965 p. 67, and January 1965 p. 63.

Bulgaria

ATLANTIC FISHERIES EXPANSION PLANNED:

The Bulgarian Government has authorized the construction of a new fishing port and fish-processing plant at Burgas, on the Black Sea. The port will be the first to service the Bulgarian high-seas fishing fleet which is be-

Bulgaria (Contd.):

ing organized through domestic construction and purchases in the U.S.S.R. The construction of a 310-meter (1,017-foot) wharf was begun in January 1965 after East German naval specialists dredged the adjacent Bay of Burgas to accommodate vessels having a draft of up to 9 meters (29.5 feet).

Adjoining the new fishing port will be a fish-processing plant capable of producing 13,000 metric tons of fishery products annually (10,000 tons of canned, 1,000 tons of smoked, 1,000 tons of salted, and 1,000 tons of semifinished fishery products). The new processing plant will be the only one of its kind in Bulgaria; its output will be marketed domestically.

A cold-storage warehouse with a capacity of 4,000 tons of fish will also be located near the Burgas fishing port, which is scheduled to become fully operational at the end of 1966.

Most of the machinery and equipment for both the fishing port and the fish-processing plant will be supplied by the Soviet Union under the U.S.S.R.-Bulgarian aid agreement of January 24, 1964. The agreement also provides for the delivery to Bulgaria of 20 large stern factory trawlers and 4 refrigerated fish transport vessels by 1970. The Soviet Union has already delivered to Bulgaria the Tropik-class trawlers Feniks and Albatross under long-term credits provided by the aid agreement. In return for Soviet aid, the Bulgarians will begin constructing 300-gross-ton fishing trawlers for the U.S.S.R. (120 such vessels are to be delivered by 1970).

Plans call for the proposed Bulgarian fishing fleet of 20 factory stern trawlers to remain on the fishing grounds for 3 to 6 months, catching and processing 25 to 30 tons of fish daily. They will be serviced about every 2 weeks by a refrigerated carrier which will transport the finished and semifinished fishery products to Burgas. This is essentially the system of operations employed by the U.S.S.R. in her distant fisheries. The Bulgarians will first try to develop West African operations, but as more vessels are obtained, trips to Icelandic and Northwest Atlantic grounds are planned. Later, fishing may be expanded into the Indian Ocean, but this will depend to a great extent on the success the Soviet fishermen have there. By 1980, about 1,600 Bulgarians may be employed in high-seas fisheries.

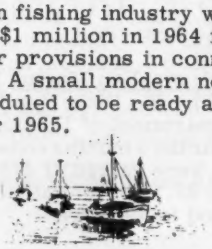
In the past, Bulgaria has limited its fisheries mostly to fresh waters (the Danube River, lakes and ponds) and to the Black Sea where her fisheries are regulated by the Joint Black Sea Fisheries Commission composed of the U.S.S.R., Rumania, and Bulgaria. Less favorably situated for Black Sea fishing than the Soviet Union or Turkey, Bulgaria began planning in 1962 for a high-seas fishery with Soviet assistance. The plans were spelled out at the Eighth Congress of the Bulgarian Communist Party in 1962 and approved by the Second Session of the Fourth National Assembly. The Bulgarian goal for the fishery catch of 1980 was set at 100,000 tons, or 9 times the 1962 fishery catch of 10,000 tons.
Note: See Commercial Fisheries Review, April 1964 p. 51.

Republic of Cameroon

FISHERY TRENDS, 1964:

Fishery landings in Cameroon (West Africa) in 1964 by her fleet of 14 trawlers amounted to 8,000 metric tons. About 1,700 persons were engaged in that country's fishing industry, with wages paid for the year totaling some 170 million CFA francs (US$700,000).

The Cameroon fishing industry was estimated to have spent $1 million in 1964 for ice, boxes, fuel, and other provisions in connection with its fisheries. A small modern new fishing port was scheduled to be ready at Douala by early summer 1965.



Chile

FISH MEAL INDUSTRY CONTINUES TO SUFFER FROM ANCHOVETA SHORTAGE IN APRIL 1965:

Poor fishing in April 1965 added yet another month to the prolonged anchoveta shortage which has left the $75 million Chilean fish meal industry in a serious financial crisis. Six plants are reported closed and others are closing (some continue to fish, but pool the catch for processing in one plant to reduce unit costs). The Chilean Fisheries Development Institute reports that fish meal production has dropped to about 10 percent of installed capacity. The number of fish meal industry workers thrown out of work in Tarapaca Province is estimated at 3,000.

On May 11, 1965, the Production Development Corporation of Chile (CORFO) granted its Executive Vice President broad authority to take a variety of measures to: (1) alleviate the current financial burdens on the fish meal companies; (2) promote a more efficient industry; and (3) foster other development projects which would offset growing unemployment in fisheries. Details concerning the program are expected to be announced soon.

Unfortunately relief measures can't supply the missing anchoveta. (United States Embassy, Santiago, May 15, 1965.)

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SHELLFISH INDUSTRY SHOWS PROMISE:

With an anchoveta shortage plaguing the fish reduction industry in northern Chile, interest is beginning to turn to the less developed fisheries off the central and southern coasts of the country. The shellfish industry, in particular, is attracting attention.

A rise in exports is expected because of expanded output of frozen shrimp (a deep-water species) and langostino (a salt-water crayfish classified in some foreign markets as "baby rock lobster-type meat"). Annual export earnings from that trade might reach $5 million within 3 years. In addition, the domestic market for fresh and frozen shrimp and langostino is largely untapped. Another possibility for the Chilean shellfish industry is the development of an export market for spiny lobsters.

Shrimp and Langostino: Official Chilean data show a 1963 catch of 3,634 metric tons of shrimp and 9,248 tons of langostino, as compared with 4,346 tons of shrimp and 7,986 tons of langostino in 1962. Preliminary data show some increase in 1964 landings.

Ex-vessel prices of shrimp with heads on were up sharply in 1964, ranging from escudo 3.0 to 3.6 for a box of 16 kilos (about 2.5 to 3.0 U. S. cents a pound). That was an increase of about 60 percent over the 1963 prices. In 1964, langostino (with heads on) ex-vessel prices were escudo 2.0 to 2.2 for a box of 14 kilos (1.9 to 2.1 U. S. cents a pound), as compared with 1963 prices ranging from escudo 1.2 to 1.5 (1.1 to 1.4 U. S. cents a pound).

The recovery rate of shrimp meat is about 16 percent of landings, while langostino yields 8 to 10 percent.

Chile produced 925 tons of frozen shrimp and 776 tons of frozen langostino in 1964, as compared with 553 tons and 674 tons, respectively, in 1963. Canned output of shrimp and langostino combined totaled 88 tons in 1964 and 83 tons in 1963.

About 85 percent of Chile's frozen shrimp and langostino output is exported. Frozen shrimp exports in 1964 totaled 774 tons with a value of US$1.1 million. The United Kingdom was the leading buyer, followed by the United States and Germany. Shipments to the European market where higher prices prevail have been encouraged by the Chilean Government through its export licensing system.

Although exact data on frozen langostino exports are not available, it is known that about 85 percent of all shipments go to the United States.

Sales of canned shrimp and langostino depend mainly on the domestic market in Chile.

Shrimp and langostino are fished commercially off Chile from Coquimbo to Talcahuano by trawlers at depths up to 500 fathoms. Shrimp are captured the year round; langostino from March until mid-December. A larger shrimp is being captured off Constitucion than that taken to the north of San Antonio. Experimental fishing indicates that shrimp can be fished along the coast to the Straits of Magellan, but further study is necessary to determine the feasibility of commercial exploitation in the southern waters.

Chile (Contd.):

At the close of 1964 there were at least 6 plants freezing shrimp and langostino in Chile, and 2 other freezing plants were under construction. Other fishing companies were thinking of entering the field.

Chilean shrimp are not generally sorted by size. All shrimp and langostino are cooked and peeled before freezing, but only the langostino are deveined. The pack consists of individually frozen tails as well as the block-frozen product. Processing of individually frozen tails will increase with the completion of several blast-freezing tunnels now under construction. Most firms now use plate freezers.

Spiny Lobster: One of the new shrimp-freezing plants being built in San Antonio, Chile, is also interested in the potential of Chile's spiny lobster resources--now exploited only on a limited scale and almost entirely for the domestic market. If exploratory fishing justifies an investment, the company (which is predominately foreign owned) could place a well-equipped fleet in spiny lobster fishing. Its catch would most likely be processed for the export market. (United States Embassy, Santiago, May 25, 1965.)

Denmark

EXPORTS OF FISHERY PRODUCTS AND BYPRODUCTS, JANUARY-MARCH 1965:

Exports to All Countries: Denmark's total exports of fishery products and byproducts in January-March 1965 were up 7 percent in quantity and 19 percent in value as compared with the same period in 1964. Exports were up for all major items in quantity and value except frozen fishery products. Despite the lower exports of frozen fishery products in the first quarter of 1965, the value rose 14 percent from the same quarter in 1964 due to increased exports of cod as against a drop in herring exports. With higher world prices for fish meal, exports of that product were up 41 percent in quantity and 64 percent in value.

Exports to United States: The value of Danish fishery products exports to the United States in the first quarter of 1965 was higher than in the same period of 1964. After a sharp drop from 1963 to 1964, Danish shipments of frozen cod blocks to the United States market made a comeback. Exports of canned herring and sprat also were higher probably because of the smaller pack of canned Maine sardines.

Danish Exports of Fishery Products, January-March 1964 and 1965

Products	January-March 1/1965 Qty. (Metric Tons)	1/1965 Value (US$ 1,000)	1964 Qty. (Metric Tons)	1964 Value (US$ 1,000)
To all countries:				
Fresh products	55,127	13,823	53,829	12,323
Frozen products	11,422	6,722	12,435	5,864
Processed fishery products	1,998	1,499	3,998	2,713
Fish meal & solubles, etc. 2/	18,032	2,753	12,762	1,673
Canned products:				
Fish	1,711	959	3/	3/
Shellfish	410	488	3/	3/
Semipreserved products	733	716	3/	3/
Total	89,433	26,960	83,024	22,573
Fish oil	12,405	2,405	3/	3/
To United States:				
Fresh & frozen products:				
Fillets:				
Cod	1,508	873	1,016	458
Other fillets	4	4	36	23
Pond trout	84	86	104	117
Norway lobster	27	85	65	177
Other	15	16	29	23
Cured products (smkd. & sltd.)	6	5	9	6
Canned products:				
Herring & sprat	242	150	161	106
Shrimp	19	27	41	57
Other	34	20	19	15
Semipreserved products	9	13	4	7
Fish solubles	150	22	-	-
Total	2,098	1,301	1,484	989

1/Preliminary.
2/Includes ensilage and trout food.
3/Not shown.
Notes: (1) Values reported in Danish kroner and converted to U. S. dollars; 1 kroner equals $0.145.
(2) Fish oil data not shown because they are collected by another Ministry.
Source: Danish Ministry of Fisheries.

Exports to Other Markets: In January-March 1965, exports to European Common Market countries were valued at US$11.5 million, an 11-percent increase from the same period in 1964. Shipments to European Free Trade Association (EFTA) countries in the first quarter of 1965 were also valued at $11.5 million, having increased 31 percent from 1964. West Germany was the leading buyer of Danish fishery products in the first quarter of 1965 with receipts valued at $7.8 million, followed by the United Kingdom with a value of $4.6 million. Shipments to Sweden during the period were valued at $4.1 million. Those countries ranked in the same order as in the previous year as buyers of Danish fishery products and byproducts. (Regional Fish-

Denmark (Contd.):

eries Attache for Europe, United States Embassy, Copenhagen, May 26, 1965.)

Ecuador

TUNA LANDINGS AND EXPORTS, 1964:

Ecuadoran landings of tuna and bonito dropped from a total of 13,100 metric tons in 1963 to 9,800 tons in 1964, according to preliminary data from the Ecuadoran National Fisheries Institute. Bad weather was said to be one of the causes of the decline.

In spite of the drop in landings, Ecuadoran exports of canned tuna increased. A total of 1,877 tons of canned tuna valued at US$1.19 million was shipped in 1964, compared with 1,586 tons valued at $976,000 in 1963. All but about 6 percent of the canned tuna exports were for the United States market. Local consumption of canned tuna in Ecuador in 1964 reached 212,000 cases (24 pounds each), only slightly less than the amount exported. Local consumption in 1965 is forecast at about the same level.

In 1964, exports of whole frozen tuna totaled 3,103 tons valued at about $494,000 as compared with 2,046 tons worth $320,000 in 1963. The 1963 exports also included 1,325 tons of headed and gutted frozen tuna valued at $220,000. Comparable data on 1964 exports of headed and gutted tuna were not available. As in the case of canned tuna, the United States is the leading market for Ecuadoran exports of frozen tuna.

The Ecuadoran tuna fleet increased by 7 units in 1964 to a total of 51 vessels. Most of those have a limited range and concentrate their activity around the port of Manta and the Santa Elena peninsula when the tuna are running. As of summer 1965, 4 purse-seine tuna vessels were operating, of which 3 (with capacities of 50 to 80 tons each) belonged to a large cannery (operated by U. S. interests) at Manta. (United States Consul, Guayaquil, June 18, 1965.)

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SHRIMP LANDINGS AND EXPORTS, 1964:

Ecuador's annual shrimp landings have leveled off at about 5,000 metric tons (live-weight basis) in recent years. Most of those landings are frozen for export, mainly to the United States.

Ecuador's exports of frozen shrimp tails in 1964 amounted to 2,441 tons valued at US$1.7 million, compared with 2,453 tons valued at $1.6 million in 1963. Domestic annual consumption is estimated at about 350 tons (live-weight basis).

There were no large investments in Ecuador's shrimp industry in 1964. The shrimp fleet currently comprises 160 vessels, 24 of which were built in 1963, the most active construction year since 1958 when 31 vessels were launched. Improved refrigeration and net handling equipment are being installed on some of the vessels, but a large part of the shrimp fleet still lacks the gear and refrigeration equipment which would permit fishing off the coast in waters of 30 fathoms or more. (United States Consul, Guayaquil, June 18, 1965.)

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SPINY LOBSTER LANDINGS AND EXPORTS, 1964:

Ecuador's exports of frozen lobster tails have risen consistently in recent years, but declined somewhat in 1964 to 80 metric tons valued at US$130,000, compared to 92 tons worth $152,000 in 1963. The catch (live-weight basis) fell off from 400 tons in 1963 to 300 tons in 1964, due in part to the lack of organization in the industry. Although one firm has been experimenting with traps, which have the disadvantage of being easily stolen, lobsters are mostly caught by net and hand. Preliminary statistics show that live lobster exports climbed to 15 tons in 1964 valued at $7,500, compared to only 4 tons in 1963 worth $1,900. Almost all lobster exports go to the United States. (United States Consul, Guayaquil, June 18, 1965.)

El Salvador

EXPORT TAX ON SHRIMP BEING STUDIED:

Possible modifications to the export tax levied on shrimp by El Salvador are being studied by a committee made up of officials of the Salvadoran Ministries of Economy and Finance. The shrimp export tax is now 6 U.S.

El Salvador (Contd.):

cents a pound regardless of the value of the shrimp. Such a tax tends to limit shrimp exports to the United States to the larger sizes. Salvadoran exporters find it unprofitable to ship smaller and less costly shrimp because of the high proportion of the sales price absorbed by the export tax. (United States Embassy, San Salvador, May 21, 1965.)

Guatemala

FROZEN SHRIMP EXPORTS, 1964:

Guatemala's exports of frozen shrimp in 1964 amounted to 2.9 million pounds valued at slightly more than US$1 million. The greater part went to the United States which received 2.2 million pounds.

In January-March 1965, United States imports of frozen shrimp from that country totaled 498,000 pounds as against 631,000 pounds in the same period a year earlier. (United States Embassy, Guatemala, May 20, 1965.)

Iceland

EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, APRIL 30, 1965:

Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 7,100 metric tons as of April 30, 1965.

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled 17,812 metric tons of groundfish blocks and slabs, 4,669 tons of cod fillets, 2,791 tons of haddock fillets, and 548 tons of ocean perch fillets. (United States Embassy, Reykjavik, June 2, 1965.)

Icelandic Export Stocks[1] of Principal Fishery Products, April 30, 1965

Item	Quantity	Value	
	Metric Tons	Million Kr.	US$ 1,000
Groundfish, frozen:			
For export to:			
U. S.	7,100	156.2	3,627.5
Other countries	4,552	78.7	1,827.7
Stockfish	4,500	126.0	2,926.1
Herring:			
Salted	2/	2.1	48.8
Frozen	1,174	6.7	155.6
Industrial products:			
Fish meal:			
Herring	1,147	8.3	192.7
Other fish	9,519	48.4	1,124.0
Herring oil	14,783	122.7	2,849.5

1/Includes only stocks intended for export.
2/Not available.
Note: Icelandic kronur 43.06 equal US$1.00.

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FISHERY LANDINGS BY PRINCIPAL SPECIES, 1963-64:

Species	Jan.-Nov.		Year Totals	
	1964	1963	1964	1/1963
	(Metric Tons)			
Cod	275,189	226,508	280,703	240,068
Haddock	53,134	46,850	56,689	51,606
Saithe	21,223	13,722	21,793	14,712
Ling	4,699	5,318	4,990	5,601
Wolffish (catfish)	8,218	17,077	8,289	17,463
Cusk	3,225	5,473	3,542	5,849
Ocean perch	26,757	31,718	27,707	35,373
Halibut	1,151	1,112	1,205	1,232
Herring	516,733	383,801	544,396	395,166
Shrimp	497	603	542	649
Capelin	8,640	1,077	8,640	1,077
Lobster	2,628	5,177	2,631	5,179
Other	10,097	7,375	10,387	7,994
Total	932,191	745,811	971,514	781,969

1/Revised.
Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, 1963-64:

How Utilized	Jan.-Nov.		Year Totals	
	1964	1963	1964	1/1963
	(Metric Tons)			
Herring[2]:				
Canning	218	296	270	296
Oil and meal	436,057	271,489	460,409	274,704
Freezing	24,703	32,260	26,420	37,723
Salting	55,755	73,955	57,298	76,642
Fresh on ice	-	5,802	-	5,802
Groundfish[3] for:				
Fresh on ice	35,945	34,375	39,892	40,171
Freezing and filleting	178,659	162,496	183,849	174,485
Salting	88,907	70,527	89,685	72,459
Stockfish (dried unsalted)	83,346	70,983	84,119	74,256
Canning	27	47	27	47
Oil and meal	3,548	3,321	3,687	3,573
Capelin for:				
Freezing	133	188	133	188
Oil and meal	8,507	889	8,507	889
Shrimp for:				
Freezing	299	475	344	507
Canning	198	128	198	141
Lobster for:				
Fresh on ice	-	2	-	2
Freezing	2,628	5,175	2,630	5,177
Home consumption	13,261	13,403	14,046	14,907
Total production	932,191	745,811	971,514	781,969

1/Revised.
2/Whole fish.
3/Drawn fish.
Source: Aegir, March 1 and 15, 1965.

India

JAPANESE FISHING FIRM PLANS JOINT SHRIMP COMPANY IN INDIA:

A Japanese fishing company, after surveying shrimp fishing prospects in India, is reported to have started negotiations to establish a joint shrimp fishing and processing enterprise in that country. At present, one Japanese company is engaged in shrimp fishing in India (at Cochin) and is said to be doing well. (Suisancho Nippo, June 24, 1965.)

Japan

FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, JANUARY-MARCH 1965 AND YEAR 1964:

Japan's exports of frozen tuna to the United States and Puerto Rico in March 1965 were down 46.1 percent in quantity and 45.1 percent in value from the previous month when they totaled 10,050 short tons. As compared with January 1965, the March exports were lower by 24.5 percent and 30.0 percent, respectively.

The March exports were about equally divided in quantity between the United States and Puerto Rico, with albacore tuna accounting for 67 percent and yellowfin 32 percent. The remainder was mostly big-eyed tuna.

Albacore tuna accounted for 59.7 percent of Japan's total frozen tuna exports to the United States and Puerto Rico in 1964, and yellowfin 39.6 percent. The remainder was mostly big-eyed tuna. Of the total exports to the United States, albacore accounted for 57.3 percent and yellowfin 41.8 percent. Exports to Puerto Rico were made up of 63.0 percent albacore, with the remainder mostly yellowfin and some big-eyed tuna. (Fisheries At-

Table 1 - Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, January-March 1965

Species	1965						Total Jan.-March 1965	
	March		February		January			
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Short Tons	US$1,000	Short Tons	US$1,000	Short Tons	US$1,000	Short Tons	US$1,000
Skipjack:								
United States	2	1	3	4	3	4	8	10
Puerto Rico	-	-	-	-	-	-	-	-
Total	2	1	3	4	3	4	8	10
Albacore:								
United States	1,270	383	4,170	1,183	3,454	1,173	8,894	2,739
Puerto Rico	2,335	634	4,069	1,113	2,395	659	8,799	2,406
Total	3,605	1,017	8,239	2,296	5,849	1,832	17,693	5,145
Yellowfin:								
United States	1,303	406	1,267	388	544	165	3,114	959
Puerto Rico	405	97	455	114	782	207	1,642	418
Total	1,708	503	1,722	502	1,326	372	4,756	1,377
Big-eyed:								
United States	98	24	30	4	-	-	128	28
Puerto Rico	5	1	56	11	-	-	61	12
Total	103	25	86	15	-	-	189	40
Total United States	2,673	814	5,470	1,579	4,001	1,342	12,144	3,736
Total Puerto Rico	2,745	732	4,580	1,238	3,177	866	10,502	2,836
Grand total	5,418	1,546	10,050	2,817	7,178	2,208	22,646	6,572

Source: Japan's Bureau of Customs.

Table 2 - Japan's Exports of Frozen Tuna by Species to United States and Puerto Rico, 1964

Species	United States		Puerto Rico		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
	Short Tons	US$1,000	Short Tons	US$1,000	Short Tons	US$1,000
Albacore	35,987	11,413	29,138	9,261	65,125	20,674
Yellowfin	26,286	8,755	16,926	4,406	43,212	13,161
Big-eyed	539	115	199	42	738	157
Skipjack	3	2	-	-	3	2
Bluefin	3	1	-	-	3	1
Total	62,818	20,286	46,263	13,709	109,081	33,995

Source: Japan's Bureau of Customs.

Japan (Contd.):

tache, United States Embassy, Tokyo, April 16 and May 28, 1965.)

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FOURTH CANNED TUNA IN BRINE SALE TO UNITED STATES:

The Japan Tuna Packers Association announced June 15, 1965, that it planned to offer for the fourth sale (June-July) 250,000 cases (performance quota 175,000 cases and adjustment quota 75,000 cases) of canned tuna in brine for export to the United States. The sale was to consist of 220,000 cases of white meat tuna (20 percent of which must be chunk style) and 30,000 cases of the light meat 4-lb. pack, including a small quantity of the 7-oz. and $3\frac{1}{4}$-oz. pack. The Association set the shipping period deadline as July 15 and revealed that it was providing US$110,000 for the summer promotion of the 220,000 cases of white meat tuna.

Subsequent buy tenders submitted by trading firms amounted to only 44,163 cases of the available adjustment quota. (Note: Firms which use their performance quota and wish to export additional quantities can dip into the adjustment quota.) The lack of buying interest shown by trading firms was said to reflect poor market conditions in the United States for Japanese tuna. (Suisancho Nippo, June 17, 1965; Kanzume Nippo, June 22, 1965.)

* * * * *

CANNED TUNA MARKET TRENDS:

A recent Japanese survey of U. S. canned tuna market conditions revealed that prices of U. S.-advertised brands advanced, while prices of Japanese name brands held firm. Despite this trend most of the 18 designated Japanese firms exporting canned tuna in brine to the United States were asking the Japan Canned Tuna Sales Company to reduce prices. The survey also revealed that on the third sale (offering of 350,000 cases) conducted by the Sales Company, the trading firms failed to completely use the full quantity of 105,000 cases offered under the 30-percent adjustment quota; whereas at the second sale (120,000 cases represented the adjustment quota) conducted in early May, the exporting firms submitted offers greatly exceeding (by nearly 90,000 cases) the quantity put up for sale by the Sales Company.

Observers in Japan viewed these developments as follows:

1. The price decline in the frozen albacore market since early this year has enabled U. S. packers in Puerto Rico to pack tuna at substantially lower costs, and they are using gains derived from this to promote sales of their advertised brands and reduce prices of private labels.

2. A great majority of the 18 Japanese exporting firms which do not handle name brands are being driven into a difficult situation by price cuts on private labels carried out by their U. S. competitors.

3. Under the new sales structure established by the Japan Canned Tuna Sales Company, whereby a large portion of the adjustment quota is allotted to trading firms submitting large buy orders, some firms handling small volume of exports have begun to force themselves to sell larger quantities so as to acquire a greater share of the adjustment quota. This practice has tended to further disrupt the market for Japanese "off" labels.

4. These developments are progressively ruining the position of Japanese name brand packs in the U. S. market. To maintain prices, it has become necessary to temporarily suspend efforts to expand the market for name brands.

5. In view of the situation wherein the majority of the 18 trading firms is seeking a price reduction at a time when the Sales Company is struggling with an excessive supply of canned tuna, many exporting firms have begun to withhold purchases on the assumption that the Sales Company may likely lower its prices in the future. (Suisan Tsushin, May 24, 1965.)

Editor's Note: The situation with regard to the excessive supply of canned tuna mentioned in (5) above is not expected to improve due to the excellent catches of albacore made off Japan in the pole-and-line summer fishery. Japanese packers were actively buying fish available to them at very low prices, as low as US$227 a short ton (as of May 27), ranging upwards to $315 a ton. The fishery usually begins tapering off after early June and ends in July.

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Japan (Contd.):

CANNED TUNA PACK, MARCH-APRIL 1965:

Data compiled by the Shizuoka Packers Association reveal that in March and April 1965 its 49 member firms packed a total of 197,292 cases of tuna in oil and 285,351 cases of tuna in brine. Not included was canned skipjack, which totaled about 100,000 cases. Of the above, 109,012 cases of tuna in oil (55 percent) and 284,292 cases of tuna in brine (99 percent) were marked for export. (Kanzume Nippo, June 17, 1965.)

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U. S. CONSUMER RESPONSE TO JAPANESE SPECIALTY-PACK TUNA:

A study in the New York area to determine consumer response to Japanese canned tuna packed in vegetable (health food) was recently made by the Japan External Trade Promotion Organization (JETRO). Results obtained from that study follow:

Component	Response	Percentage of Response
Appearance	Excellent	13
	Good	37
	Poor	1/50
Taste-flavor	Excellent	29
	Good	42
	Poor	2/29
Smell 3/	Excellent	49
	Good	39
	Poor	12
Texture	Excellent	4/33
	Good	20
	Poor	5/36
Proportion vegetable to tuna	Just right	64
	Too much vegetable	35
	Too little "	1
Importance as health food	Very important	6/29
	Somewhat important	36
	Not important	35
Desire to buy	Yes	7/39
	No	61

1/Contents appeared spoiled; color too dark and lacked coloring; too oily; does not look like tuna pack.
2/Tasteless; too strongly flavored.
3/Half of samplers impressed by tuna flavor, other half by absence of tuna smell.
4/Soft and tender.
5/Too soft.
6/Low cholesterol content.
7/Of "yes" respondents, 48 percent were under 35 years of age. Most were impressed by unique flavor and said they expect to use the product for salad or casserole, and majority felt 35-40 cents a can was fair price.

Marketing people all showed negative response, saying that the product would not sell in the United States for reasons of taste, flavor, and quality. Further, almost all of them thought the description of contents on the label unlawful. (Suisan Tsushin, May 31, 1965.)

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SUMMER ALBACORE POLE-AND-LINE FISHERY TRENDS:

The Japanese summer albacore pole-and-line fishery continued excellent into June 1965, with landings of over 1,000 metric tons almost daily. On June 8, a total of 1,604 metric tons was landed at the three Japanese ports of Yaizu, Shimizu, and Misaki. As of June 10, a total of 33,000 tons were landed at those ports. Ex-vessel prices at Yaizu on June 8 ranged from 93-100 yen a kilogram (US$234-252 a short ton) for medium (18-24 lbs.) and 77-96 yen a kilogram ($194-242 a short ton) for under 18-pound fish.

On June 14, a total of 660 metric tons of pole-and-line caught albacore tuna was landed at the Japanese tuna ports of Yaizu and Shimizu. As of that date the total summer fishery catch exceeded 40,000 tons. However, it was reported that about mid-June the catch had fallen off rapidly and unless fishing improved the catch of 50,000 tons forecast earlier might not be reached. Ex-vessel prices at Yaizu on June 14 were 94-100 yen a kilogram (US$237-252 a short ton) for medium and large fish (over 18 pounds) and 85-95 yen a kilogram ($214-239 a short ton) for under 18-pound fish. On June 17, ex-vessel prices at Yaizu were up and ranged from 104-117 yen a kilogram (US$262-295 a short ton) for albacore over 18 pounds and 99-102 yen a kilogram ($250-257 a short ton) for under 18-pound fish. Compared to early June, ex-vessel prices were up.

The price of frozen round albacore tuna for export to the United States also increased in mid-June from $270 to $275 a short ton f.o.b. Japan. The export price was expected to go up to $280 a ton.

Fishing was excellent in May also, with 23,803 tons landed at the port of Yaizu May 1-15. Including April landings of 4,684 tons, landings at that port April 1-May 15, 1965, totaled 28,487 metric tons. Albacore were landed also at such ports as Shimizu, Misaki, and Nakaminato.

The heavy landings caused a drop in ex-vessel prices to as low as 85 yen a kilogram (US$214 a short ton) on May 12. High for that day was 120 yen a kilogram ($302 a short ton).

Japan (Contd.):

Data published by the Fisheries Agency show April-May 1965 Yaizu landings as the highest ever recorded for that port since 1957 (data prior to 1957 unavailable). A total catch of 50,000 metric tons or more had been forecast for the summer albacore fishery.

Export prices declined, from US$365 a short ton c. & f. in April to $345 a ton near mid-May. (Suisan Keizai Shimbun, May 21, June 9, 15, and 18, 1965; Suisan Tushin, June 19, 1965; Fisheries Agency 1965 Fishing Condition Report Nos. 8-10, and 13.)

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ATLANTIC ALBACORE TUNA FISHING AND MARKET TRENDS, MID-MAY 1965:

The Japanese Atlantic albacore tuna fishery commenced in mid-May 1965, somewhat earlier than usual. Fishing was reported good and daily more vessels were switching to that fishery.

The export price of frozen round Atlantic albacore tuna transshipped to Puerto Rico dropped from the late May price of US$305 a short ton f.o.b. port of shipment to $295 a ton in mid-June. (Suisan Tsushin, June 19, 1965.)

* * * * *

TUNA INDUSTRY MEMBERS DISCUSS ALBACORE MARKET STABILIZATION:

Members of the Japanese tuna industry representing producers, freezers, packers, and exporters held a meeting at Tokyo on June 16, 1965, to discuss measures to stabilize the albacore tuna export market. It was acknowledged at the meeting that the stabilization of albacore prices was of common benefit to all, but the discussions did not proceed to a point where a study of concrete plans to stabilize prices could be undertaken. Further, no new acceptable plan that could be implemented to cope with the immediate problem resulting from the excellent catches made by the pole-and-line albacore fishery was presented. The consensus of the meeting was that the albacore problem should be examined in its entirety.

In an exchange of views among members of the Atlantic Committee, the majority agreed that Atlantic albacore transshipments should be held to the 36,000 ton-per-year level. However, due to conflict of interests and to technical difficulties involved in implementing such a quota, the submission of a definite allocation plan was deferred to the next meeting. (Suisan Keizai Shimbun, June 18, 1965.)

* * * * *

TUNA MOTHERSHIP FLEET CATCH IN SOUTH PACIFIC:

The catcher vessels of Taiyo Fishing Company's tuna mothership Yuyo Maru (5,043 gross tons), which commenced fishing in the South Pacific near the Fiji Islands in late May 1965, were reported to be averaging two tons per day. As of May 28, the tuna mothership fleet had landed a total of 426 metric tons of fish, consisting of 46 percent yellowfin, 19 percent albacore, 10 percent other tuna species, 17 percent spearfish, and 8 percent miscellaneous fish. (Minato Shimbun, June 3, 1965.)

* * * * *

TUNA PURSE-SEINER OPERATION OFF GUAM CANCELLED:

A large Japanese fishing company, which was earlier reported to be planning to dispatch the tuna purse seiner Kenyo Maru (240 gross tons) to survey the waters off Guam in October 1965, was reported to have cancelled its plans. The Kenyo Maru, a converted purse seiner, is the first Japanese fishing vessel to be equipped with a power block (in 1962). (Shin Suisan Shimbun Sokuho, June 22, 1965.)

* * * * *

FRESH BLUEFIN TUNA COMMANDS HIGH PRICE:

On June 7, 1965, two metric tons of fresh trap-caught bluefin tuna were landed at Kesennuma, Japan. They brought prices ranging from 13,000-15,000 yen per 10 kilograms (US$3,280-3,780 a short ton). The tuna, which averaged about 220 pounds in size, were sold to the fresh fish trade. (Nihon Suisan Shimbun, June 14, 1965.)

* * * * *

SOVIETS OFFER EXCHANGE OF TUNA FISHING DATA:

The Soviet Union has offered to exchange during 1965 tuna data with Japan. The Soviet offer was made in response to the proposal

Japan (Contd.):

initiated in 1963 by the Misaki Fisheries Experimental Station in Kanagawa Prefecture that the two countries exchange tuna fishing information. Following receipt of the Soviet offer, the Misaki Station forwarded to the Soviet Government tuna data for 1964. Exchange data from the Soviet Union had not yet been received as of early summer but they were expected to reveal the extent of Soviet interest in, and the type of gear and methods used for, tuna fishing. (Suisan Keizai Shimbun, May 29, 1965.)

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SALMON FISHING SEASON IN NORTH PACIFIC AREA B SHORTENED DUE TO GOOD FISHING:

Data compiled by the Japanese Fisheries Agency revealed that the salmon catch in North Pacific Area B (south of 45° N. latitude), including the Japan Sea, was better than anticipated, totaling about 44,000 metric tons as of June 18, 1965. Production quota for Area B was 59,000 tons. As a result, the Agency announced that it would close the long-line fishery one week earlier than planned, on June 23 instead of June 30. The Agency also revealed that it would shorten by one week the period in which permits would be issued to gill-net fishing vessels licensed to operate in Area A (between 45° N.-48° N. latitudes). This measure, in effect, would compel gill-netters to terminate their operations in Area B earlier so as to be able to return to port in sufficient time to pick up their permits to fish in Area A. The permit issuing period was changed from June 21-July 10 to June 21-July 3. (Suisan Keizai Shimbun, June 20, 1965.)

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PINK SALMON CATCH IN JAPAN SEA:

The Japanese pink salmon catch in the Japan Sea was estimated to total 3,000 metric tons as of May 31, 1965. The fishery closed on June 15. Catch quota for that fishery was 3,500 tons. (Minato Shimbun, June 12, 1965.)

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SALMON PRICE AND PACK TRENDS, MID-JUNE 1965:

The ex-vessel price of pink salmon landed by the Japan-based vessels operating in the North Pacific was holding at the high level of about 260 yen a kilogram (30.5 U.S. cents a lb.) in mid-June 1965. The pack to that date of canned pink salmon for the export market was estimated at 100,000 cases, consisting of 85,000 cases of the ½-lb. pack and 15,000 cases of the ¼-lb. pack.

At the beginning of the packing season, the land-based packers agreed to provide special incentives for the pack of the ½-lb. can and to penalize for the packing of the ¼-lb. can so as to avoid the situation in 1964 when packers concentrated on putting up the smaller pack. This measure has resulted in making it more profitable to put up the ½-lb. size despite high ex-vessel prices. (Suisan Tsushin, June 21, 1965.)

* * * * *

CANNED SALMON EXPORT PRICES FOR 1965 SET:

The Japan Canned Salmon Sales Company, following a meeting on June 21, 1965, announced that it was setting the c.i.f. export price of canned red salmon for cases of 48 ½-lb. cans for shipment to Great Britain as follows: July shipment--155 shillings (US$21.70); August-October shipment--156 shillings ($21.84); November-December shipment--158 shillings ($22.12). In 1964 the first shipment was sold for 153 shillings and 6 pence ($21.49). Prices in 1964 averaged 155 shillings ($21.70). (Suisan Tsushin, June 22, 1965.)

* * * * *

FIRMS CONTRACT FOR EARLY DELIVERY OF CANNED SALMON TO GREAT BRITAIN:

Two Japanese fishing firms (which operate salmon factoryships) formally contracted to ship in late June 1965 a total of 200,000 cases of canned salmon to Great Britain. The firms plan to transship their products from the fishing grounds directly to Great Britain, thereby cutting down shipping time by 30 days. Under the old system whereby the factoryship-packed salmon were unloaded in Japan, inspected, reloaded, and then shipped, the trip took over 65 days. (Suisancho Nippo, June 5, 1965.)

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CANNED SALMON TO BE SHIPPED DIRECT TO GREAT BRITAIN FROM FISHING GROUNDS:

A large Japanese fishing company has chartered the cargo vessel Yumishima Maru (1,941 gross tons) for hauling direct from the fishing

Japan (Contd.):

grounds to Great Britain, 100,000 cases of canned salmon packed by its salmon mothership fleet operating in the North Pacific. The Yumishima Maru left Yokohama on June 10, 1965, to rendezvous with the salmon fleet.

Another fishing company also chartered a vessel to pick up 100,000 cases of salmon on the high seas for delivery to Great Britain. That cargo vessel was scheduled to leave Yokohama for the North Pacific around June 20. (Suisan Keizai Shimbun, June 17, 1965.)

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SALMON FISHERMEN NEGOTIATE NEW WAGE CONTRACT:

The Shiogama (Miyagi Prefecture) Chapter of the Japan Seamen's Union has concluded a new wage agreement with the Miyagi association representing owners of salmon catcher vessels engaged in the mothership-type salmon fishery. On the basis of this agreement, all of the chapters of the Seamen's Union in the northeastern prefectures, except Yamagata, have negotiated new wage contracts, as of May 17, 1965. The agreement sets the following pay scale:

Base Pay and Guaranteed Bonus:

Position	Base Pay		Minimum Guaranteed Bonus		Bonus Shares
	Yen	US$	Yen	US$	No.
Skipper-fishing captain	39,000	108.33	9,750	27.08	2.0
Fishing captain	36,000	100.00	9,000	25.00	2.0
Skipper, chief engineer, chief radio operator	30,000	83.33	7,500	20.83	1.5
Deck chief, first mate	24,000	66.67	6,000	16.67	1.2
Deck crew	18,000	50.00	4,500	12.50	1.0

Bonus for Crew:

Value of Catch 1/		Bonus Allocation
Yen	US$	Percent
Under 15 million	Under 41,667	7.1
15-20 million	41,667-55,556	17.0
Over 20 million	Over 55,556	24.0

1/ Represents value of catch delivered by catcher vessel to mothership after deducting certain expenses shared with mothership operator, such as costs of operating scout vessels and salmon hatcheries.

Daily Sea Duty Allowance:

The amount of payment of daily sea duty allowance varies according to level of base pay and area of operation. A total of five operational areas have been established, with payments ranging as follows for each level of base pay:

Base Pay		Range of Daily Allowance	
Yen	US$	Yen	US$
15,000-18,000	41.67-50.00	120-400	0.34-1.11
18,000-25,000	50.00-69.44	150-510	0.42-1.42
25,000-35,000	69.44-97.21	180-620	0.50-1.73
Over 35,000	Over 97.21	220-730	0.62-2.02

The agreement also stipulates payment of disaster compensation to crew members under the Seamen's Law or under insurance coverage to be provided by the vessel owner; compensation for personal property losses up to an amount equaling over one but less than two months' wages; and payment of up to three months' wages to the surviving family of a crew member found missing in line of duty, payment to stop upon confirmation of safety or death of the missing person. (Suisan Keizai Shimbun, May 23, 1965.)

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PACK AS OF JUNE 24 OF TWO KING CRAB FACTORYSHIPS IN BRISTOL BAY:

The two Japanese king crab factoryships (Tokei Maru, 5,385 gross tons, and Tainichi Maru, 5,859 gross tons) operating in Bristol Bay had packed a total of 88,766 cases of crab meat as of June 5, 1965. Catch per unit of effort was reported to be 9.9 crabs per shackle and yield 22.4 crabs a case.

By June 24 the two vessels had packed 112,584 cases of king crab, equal to 61 percent of their combined production quota of 185,000 cases. They were averaging 11.5 crabs per shackle and 22.5 crabs per case. (Nihon Suisan Shimbun, June 11; Suisan Tsushin, June 28, 1965.)

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ELEVEN TRAWL FLEETS LICENSED TO FISH IN GULF OF ALASKA:

The Japanese Fisheries Agency formally announced on June 1, 1965, the names of the 11 trawl fleets that will be licensed to conduct operations in the Gulf of Alaska on a commercial basis. Previously the operation of vessels in the Gulf was licensed only on an experimental basis.

Japan (Contd.):

Following is the composition of the licensed Japanese Gulf of Alaska trawl fleet as reported by Suisan Keizai Shimbun, June 2, 1965:

Mothership (Gross Tons)	Catcher Vessel (Gross Tons)
Akebono Maru No. 53 (1,450)	Nisshin Maru No. 50 (263)
Daishin Maru No. 12 (2,967	Fukushin Maru No. 1 (299)
Sumiyoshi Maru No. 12 (578)	Kintoku Maru No. 7 (298)
	Dairin Maru No. 8 (204)
Taiyo Maru No. 61 (1,496)	Taiyo Maru No. 36 (372)
Taiyo Maru No. 82 (2,886)	Taiyo Maru No. 37 (372)
Takachiho Maru (3,470)	Fukuho Maru No. 2 (299)
Tatsuta Maru (560)	Fukuho Maru (276)
Tokachi Maru (2,530)	Omi Maru (291)
Undesignated (2,000)	Kyowa Maru (246)
" (1,500)	Undesignated (300)
" (1,499)	Kohoku Maru No. 2 (295)

Editor's Note: The Japanese Central Fisheries Coordination Council (supreme government-industry fisheries advisory group) had previously approved the licensing of the trawl fleets in the Gulf of Alaska subject to the following limitations:

> Halibut, salmon, and king crab will not be taken. Those taken incidentally will be returned to the sea immediately. Catch of herring under 20 centimeters (7.9 inches) must not exceed in numbers 10 percent of the total catch of herring. Should it exceed 10 percent, vessels must immediately move away from the area. Marine plants and animals must not be taken in waters within three miles off foreign territory. The possession on board vessels of long lines and gill nets is illegal. The responsible person on board the vessel must report to the government inspector the vessel's daily catch in accordance with provisions to be stipulated separately.

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THREE BOTTOMFISH FLEETS SAILED IN MAY FOR EASTERN BERING SEA:

Japanese licensed bottomfish fleets which sailed in May 1965 to begin operations in the eastern Bering Sea included:

(1) The factoryship Itsukushima Maru (5,871 gross tons) accompanied by 18 catcher vessels ranging from 61 to 113 gross tons--departed Japan, May 17, 1965. Of the 18, 14 are combination trawl-gill net-long line vessels and 4 are combination gill net-long line vessels.

(2) The factoryship Seifu-Maru (8,331 gross tons) accompanied by 23 catcher vessels ranging from 48 to 167 gross tons--departed May 12, 1965. The fleet was to fish mainly for herring.

(3) The factoryship Soyo Maru (11,193 gross tons) accompanied by 21 catcher vessels ranging from 62 to 139 gross tons--departed May 15, 1965.

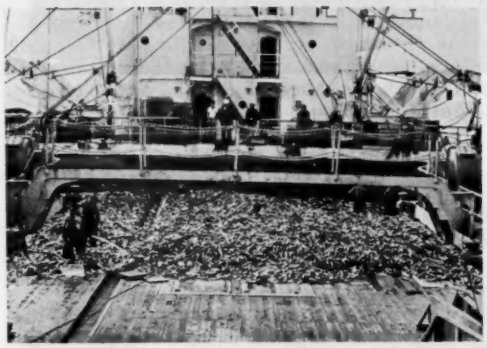

Fig. 1 - Looking forward on deck of Japanese factoryship Soyo Maru. Note conveyor in left foreground and sorters at right.

Fig. 2 - Japanese factoryship Tenyo Maru in Bering Sea.

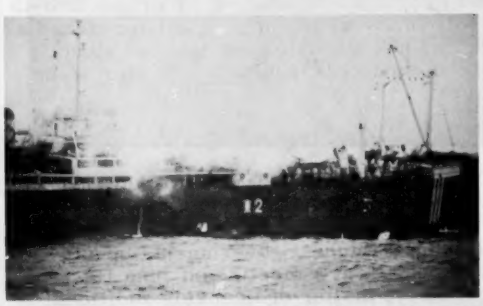

Fig. 3 - Hoyo Maru, Japanese fish meal factoryship, in Bering Sea.

Japan (Contd.):

All the licenses for the listed factoryships expire January 31, 1966.

Japanese factoryship sailings in April 1965 for the Bering Sea included the Tenyo Maru (11,581 gross tons) with 10 catcher vessels to fish mainly for Alaska pollock for conversion into minced fish; the fish meal factoryship Gyokuei Maru (10,357 tons); the factoryship Kotoshiro Maru No. 15 (700 tons); the fish meal factoryship Hoyo Maru (14,111 tons); and the shrimp factoryship Einin Maru (7,482 tons). (Fisheries Attache, United States Embassy, Tokyo, May 25, 1965, and other sources.)

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ATLANTIC OCEAN TRAWL FISHERY PRODUCTION TRENDS:

The Japanese Government has scheduled a meeting for June 18, 1965, of the Central Fisheries Coordination Council (highest government-industry advisory board) to discuss the licensing of additional trawlers for the Atlantic Ocean. In preparation for that meeting, the Japan Overseas Trawlers Association has prepared data showing production trends

Japanese Atlantic Ocean Trawl Fishery Production, 1959-65

Year	No. Vessels	Total Catch	No. Tows	Catch/Tow
		Metric Tons		Metric Tons
1965[1/]	45	34,599	23,226	1.55
1964	45	122,406	68,667	1.78
1963	34	92,084	48,938	1.88
1962	27	49,133	28,479	1.73
1961	15	27,952	16,370	1.71
1960	8	6,380	4,533	1.41
1959	2	802	831	.98

1/January-March 1965.

for 1959-65. They show that the Atlantic trawl fleet has expanded rapidly from 2 to 45 vessels in 7 years, and production reached a peak in 1964, but catch per tow has steadily declined since 1963. (Suisan Tsushin, June 14, 1965.)

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LICENSING DEFERRED OF ADDITIONAL TRAWLERS FOR ATLANTIC OCEAN:

The Japanese Central Fisheries Coordination Council (highest government-industry advisory board), at a meeting on June 18, 1965, deferred the matter of licensing additional trawlers for operation in the Atlantic Ocean until its next meeting. The Fisheries Agency, which reportedly hopes to newly license 22 vessels of 500 tons each, has been instructed to carry on discussions with other concerned ministries and industry organizations and to seek an adjustment of views. (Suisan Tsushin, June 21, 1965.)

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NEW STERN TRAWLER TO FISH OFF WEST AFRICA:

A Japanese firm's newly constructed 1,500-ton stern trawler, Daishin Maru No. 16, was scheduled to depart on her maiden voyage for the trawling grounds off West Africa on June 26, 1965. The trawler, which has a complement of 54 men, is the fourth vessel of that size to be constructed by the firm since January 1962. In addition, the firm operates the 2,967-ton trawler Daishin Maru No. 12, constructed in September 1963. (Minato Shimbun, June 16, 1965.)

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CANNED SHRIMP EXPORTS, APRIL 1965:

Japan's exports of canned shrimp in April 1965 of only 621 cases (24 ½-lb. cans) were down sharply from the 11,032 cases the previous month. In April 1964, exports were 42,684 cases. Only 180 cases were shipped to the United States in April 1965, with the remainder shipped to unspecified countries rather than to Great Britain and Canada which had been among the bigger buyers.

According to Japan's Canned Crab Sales Company (sales agent for canned shrimp), the sharp decline was caused by Japan's poor shrimp production in the North Pacific and low inventories of the 1964 pack. (Fisheries Attache, United States Embassy, Tokyo, June 3, 1965.)

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PLANS TO IMPORT SOUTH AFRICAN CANNED SARDINES:

Three Japanese firms are proceeding with plans to import from South Africa about 20,000 cases of seasoned canned sardines. South Africa is said to have agreed to put up the special pack. Japan is faced with a critical shortage of that pack due to several years of poor sardine fishing. (Suisan Tsushin, June 21, 1965.)

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Japan (Contd.):

MARINE FISHERY PRODUCTION, 1964:

The 1964 Japanese marine fishery production totaled 5.87 million metric tons, declining below the 6.0-million-ton level for the first time since 1960, according to data released by the Ministry of Agriculture and Forestry. Compared to 6.2 million tons produced in 1963, the 1964 production represents a 5-percent decrease.

Japanese Marine Fishery Production by Leading Fisheries, 1964 with Comparisons

Fishery	1964	1963
	. . . (Metric Tons) . . .	
Surrounding net	1,020,000	910,000
Medium-type trawl	740,000	600,000
Tuna pole-and-line and long line	680,000	690,000
Distant-water trawl	590,000	450,000
Isei[1] trawl	300,000	350,000
Gill-net (excludes salmon)	250,000	180,000
Squid	240,000	580,000
Small-type trawl	230,000	210,000
Saury	[2] 200,000	[2] 370,000
Mackerel pole-and-line	140,000	150,000

1/Waters west of 130° E. longitude, primarily East China Sea.
2/Estimated catch.

Fig. 1 - Japanese fishing vessels fish in all the world's oceans.

Fig. 2 - Small fishing village near Ito, Japan.

Fig. 3 - Yellowtail bunched in the net are hauled into the fishing boat on Kumanonada fishing grounds, noted as one of Japan's three largest fishing areas.

The decline in 1964 was primarily due to the low catches made in the saury and squid fisheries. Their combined total production fell by about 500,000 metric tons, from 950,000

Japan (Contd.):

Fig. 4 - A swordfish being hauled aboard a Japanese catcher boat.

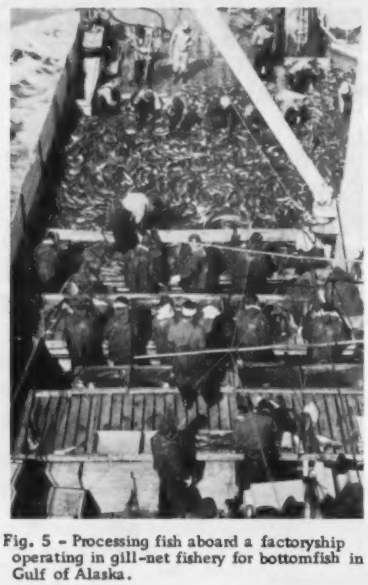

Fig. 5 - Processing fish aboard a factoryship operating in gill-net fishery for bottomfish in Gulf of Alaska.

tons in 1963 to 440,000 tons in 1964. The tuna long-line and pole-and-line fisheries catch decreased slightly, from 690,000 tons in 1963 to 680,000 tons in 1964. This marks the second successive decrease in tuna catch since 1962, when a record 720,000 tons was landed. A 30-percent production increase was achieved in the distant-water trawl fishery, from 450,000 to 590,000 tons. The increase includes 430,000 tons (1963 production was 340,000 tons) produced by the mothership-

Fig. 6 - Setting sunken gill nets from stern of a catch boat in fishery for bottomfish in Gulf of Alaska.

Fig. 7 - Deck of a Japanese fish-meal factoryship in the North Pacific.

type fishery in the "northern waters" (North Pacific and Bering Sea). The gill-net fishery (excluding salmon gill-net fishery) registered a 40-percent increase over 1963, from 180,000 tons to 250,000 tons. The increase was mainly in the catch of Alaska pollock. (Suisan Keizai Shimbun, June 2, 1965.)

Notes: (1) Does not include shellfish, aquiculture, seaweed, oysters, whaling, and several other minor fisheries.
(2) See Commercial Fisheries Review, Sept, 1964 p. 78; Sept. 1963 p. 78.

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OVERSEAS FISHERIES PROBLEMS:

Following is a report published in Nihon Keizai, May 18, 1965, describing Japanese fisheries problems at overseas bases and on the high seas:

Stagnation threatens Japanese overseas fisheries because of (1) disappointing results

Japan (Contd.):

from joint foreign ventures; (2) declining yields from high seas fisheries; and (3) foreign competition and restrictions which limit Japanese operations.

Joint Foreign Ventures: Japanese joint ventures with foreign interests have included: (1) fishing bases in the Netherlands Antilles, Malaysia, New Hebrides, and New Caledonia; (2) cold-storage plants in Brazil and Nigeria; (3) whaling operations with Brazil and Canada; (4) tuna fisheries with the Ivory Coast, Argentina, and Italy; and (5) trawl fisheries with Argentina, India, and the Bahamas.

Problems encountered in joint ventures have included: (1) foreign partners with insufficient capital and fisheries experience; (2) limitations on Japanese participation; (3) political instability; and (4) inflation. Those problems have made the outlook for such ventures less bright, although both Japanese and foreign groups continue to show interest in joint enterprises.

Distant-Water Fisheries: In addition to carrying out joint ventures with foreign interests, Japan sends self-supporting fishing fleets to many parts of the world. A declining catch rate has been a disturbing factor in a number of distant-water operations. Such declines have been experienced for some time in Antarctic whaling, South Pacific tuna fishing, and North Pacific salmon fishing. Now, declining catch rates are being reported in Japanese overseas trawl fisheries, particularly on the rich West African grounds where the average daily catch of a Japanese trawler of 1,500 to 2,500 tons has dropped from 20 metric tons to 10 tons and lower.

In the field of overseas trawling, Soviet vessels are said to be making inroads on resources fished by the Japanese. In the South Pacific tuna fisheries, Japan is facing increasing competition from the growing fishing fleets of South Korea and Taiwan. Another problem is the gradual increase in restrictions arising from the extension of territorial waters and fishing limits. Under the circumstances, voices are being raised in the Japanese fishing industry calling for a review of Japanese overseas fisheries policies.

* * * * * *

TEMPERATURES OF WATERS SURROUNDING JAPAN CONTINUE BELOW NORMAL:

Ocean conditions off Japan were again reported below normal in 1965 and like those of the previous two years. Surveys conducted in April show that water temperatures in the Pacific Ocean, Japan Sea, East China Sea, and Yellow Sea are 1° to 3° C. (1.8° to 5.4° F.) colder than normal. Japanese fishery research laboratories have been monitoring the effect that the low water temperatures may have on fishing. The greatest concern expressed is that mackerel fishing off northeastern Japan and in the Japan Sea, as in the past two years, may be adversely affected. (Nihon Suisan Shimbun, May 10, 1965.)

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RADIATION PRESERVATION OF FISH UNDER STUDY:

The Japanese Tokai Regional Fisheries Research Laboratory is studying ways to extend the storage life of fish by combining radiation sterilization with refrigerated storage. The Laboratory is trying to establish conditions for sterilization of clams for export that can be used by exporters to overcome the problem of claims made by overseas buyers.

For the domestic market, it is thought that pasteurization of fishery products with low-dose radiation would have the best chance of consumer acceptance. The Japanese people are accustomed to eating raw fish and would be very sensitive to even the slightest change in flavor resulting from irradiation.

In February 1965 a council for irradiated food studies was set up, bringing together the research organizations in the Kanto Area to analyze Japanese technical problems. The council meets once a month and is open to all researchers. At the meetings, research results and information are exchanged. It is reported that a similar council will be set up in the Kansai District of Japan. (Food Irradiation, Vol. 5, No. 3, January-March 1965.)

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FISHING VESSEL EXPORTS:

Data compiled by the Japanese Fisheries Agency reveal that in fiscal year 1964 (April 1964-March 1965) a total of 57 used fishing vessels was exported. Countries to which the

Japan (Contd.):

used vessels were exported were: Philippine Islands 25; South Korea 15; Ryukyu Islands 10; Formosa 4; Nigeria 2; and Greece 1. They included 5 vessels exported to the Philippines as payment for reparation, but not the newly constructed 144-ton class tuna vessels exported to the Republic of Korea (ROK) as refrigerated carrier vessels. A total of 11 of those tuna vessels (completed in 1964) was specially approved in February 1965 for export to South Korea to help expedite the ROK-Japan negotiations to normalize relations. The treaty was signed June 23, 1965.

In FY 1963 Japan exported 49 used and 7 new vessels; FY 1962, 69 used and 4 new vessels; and in FY 1961, 45 used and 10 new vessels. (Suisan Keizai Shimbun, June 16, 1965, and other sources.)

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FISHING VESSEL CONSTRUCTION TRENDS AS OF MAY 1965:

A Japanese fishery guidance vessel constructed with aluminum alloy parts was recently completed. The 495-ton vessel, named Chiba Maru, built for the Chiba Prefectural Government, employs aluminum alloy in its fishhold, portholes, doors, radar mast, compass support, and railings. She is the first Japanese fishing vessel to make extensive use of this light, durable metal (Minato Shimbun, May 30, 1965.)

A 19-gross-ton plastic fishing vessel, the first of its kind in Japan, was recently completed by a Japanese firm. The vessel, named Fujiura Maru No. 3, was designed as a portable boat to be deck-carried on a large fishing vessel. The greatest advantage of this plastic vessel is that it weighs 5-6 tons less than a comparable steel vessel and has much less rolling motion than a wooden vessel. Delivery price is reported to be 17,260,000 yen (US$47,944). (Hokkai Shimbun, June 7, 1965.)

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FISHING VESSEL CONSTRUCTION TRENDS, FISCAL YEAR 1964:

According to data compiled by the Japanese Fisheries Agency, 931 fishing vessels (including research and carrier vessels) totaling 128,488 gross tons were built in fiscal year 1964 (April 1964-March 1965). Compared to fiscal year 1963, it is a decline in vessel construction of 141 vessels and an increase in tonnage of some 4,563 tons. Steel vessels built in 1964 numbered 502 (639 vessels in 1963) totaling 110,680 gross tons, and wooden vessels 429 totaling 17,808 gross tons.

Steel Vessel Construction for Some Japanese Fisheries, Fiscal Years 1964 and 1963

Fishery	No. of Vessels		Tonnage	
	FY 1964	FY 1963	FY 1963	FY 1963
Distant-water trawl . .	36	14	41,699	17,576
East China Sea trawl .	61	101	6,441	10,361
Offshore trawl	56	33	4,800	3,064
Tuna	136	297	29,595	58,657
Purse seine	45	39	4,132	3,313
Salmon gill-net . . .	71	57	6,457	5,257

Tuna vessel construction showed the greatest decline: In fiscal year 1963--297 vessels and in fiscal year 1964--136 vessels. The decline was due primarily to inactivity of the tuna long-line fishery and the drop in construction of new larger vessels as replacements for existing vessels. There was a noticeable drop in the construction of 100- to 300-ton vessels, which normally make up the bulk of Japanese tuna vessel construction. The construction of wooden tuna vessels under 50 tons increased. This was attributed to the Government's action in establishing the coastal tuna fishery off Japan as a licensed fishery for vessels in the 20- to 50-ton category. Previously, vessels under 39 tons did not require licenses. (Suisan Keizai Shimbun, May 9, 1965.)

* * * * *

REFUELING VESSELS AT SEA PLANNED FOR ATLANTIC OCEAN:

A Japanese firm is planning on conducting high-seas refueling operations starting July 1965 to supply fuel to Japanese tuna vessels operating in the Atlantic Ocean. The firm planned to use the 900-ton tanker Shotoku Maru for that purpose, which was scheduled to depart Japan in mid-June.

In addition, the Shotoku Maru will supply drinking water, provisions, and other supplies to the fishing vessels, as well as provide medical service if plans to station a medical doctor aboard the tanker materialized. Similar high-seas refueling and supplying operations were successfully conducted in the Pacific Ocean in 1963 and 1964 by the Japan National Federation of Tuna Fishermen's Cooperative Associations. (Suisan Keizai Shimbun, May 27, 1965, and other sources.)

Note: See Commercial Fisheries Review, January 1964 p. 56.

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Japan (Contd.):

ANTARCTIC WHALING FLEET FOR 1965/66 SEASON REDUCED:

At the special whaling conference held in London in early May 1965, the International Whaling Commission agreed to reduce the Antarctic whale catch quota to 4,500 blue-whale units for the 20th Whaling Expedition (1965/66 season). Following that conference, the Japanese whaling firms participating in the expeditions conferred on ways of satisfactorily reducing their whale fleets and consolidating their operations. On May 21 they reached an agreement and announced that for the 20th Expedition 2 of the firms will each operate 2 fleets and the third firm will operate 1 fleet. In the 19th Expedition one of the firms operated 3 fleets and another firm operated 2 fleets.

On May 26 the Japanese Fisheries Agency announced that one of the whaling companies had been instructed to consolidate its whaling operation by eliminating its unprofitable coastal whaling operation and beginning this year its South Georgia Island base operation. At the same time, the Agency increased that firm's northern water whale catch quota by 200 blue-whale units. (Suisan Keizai Shimbun & Suisan Tsushin, May 27, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 78.

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WHALE OIL PRODUCTION BY ANTARCTIC LAND STATIONS AS OF JANUARY 1965:

Four Japanese whaling companies operating land stations (Leith Harbor and Grytviken in South Georgia) in Antarctica landed 280.3 blue-whale units, 84 sperm whales, and 5,147 seals during September 18, 1964-January 26, 1965. Production of oil from the catch totaled 5,300 metric tons of baleen oil, 680 tons of sperm oil, and 1,650 tons of seal oil.

The entire Japanese output was sold under contract to European buyers, principally in the United Kingdom. The sales price for baleen oil was US$232.40 to $236.60 a metric ton c.i.f., and seal oil at $224.

Three of the four Japanese companies terminated operations on December 3, 1964; the fourth continued whaling operations through March 1965.

The land stations in South Georgia were also leased by Japanese companies in the 1963/64 season. During that period, the catch totaled 341.2 blue-whale units and 60 sperm whales. Production of baleen oil amounted to 6,501 tons and production of sperm oil 517 tons. (Foreign Agriculture, U. S. Department of Agriculture, March 22, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 45.

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ANTARCTIC WHALE OIL AND SPERM OIL PRODUCTION, 1964/65 SEASON:

Total marine oil production from Japanese whaling in the Antarctic during the 1964/65 season was down about 11 percent from the previous season.

Japanese whale oil output from the 1964/65 Antarctic catch totaled 534,370 barrels (about

Japanese Antarctic Production of Whale Oil and Sperm Oil by Whaling Fleets and Shore Stations During the 1964/65 Season 1/

Producing Unit	Whale Oil	Sperm Oil	Total Whale and Sperm Oil
	(Barrels 2/)		
Whaling Fleets:			
Kyokuyo 2	81,077	9,547	90,624
Kyokuyo 3	76,547	7,959	84,506
Nisshin	73,676	6,835	80,511
Nisshin 2	74,324	-	74,324
Nisshin 3	41,382	29,435	70,817
Tonan	76,335	6,129	82,464
Tonan 2	72,000	6,247	78,247
Total whaling fleets	495,341	66,152	561,493
Shore Stations:			
Leith Harbour	24,235	5,071	29,306
Grytviken	14,794	1,706	16,500
Total shore stations	39,029	6,777	45,806
Total whaling fleets and shore stations	534,370	72,929	607,299

1/Preliminary.
2/Six barrels equal approximately one long ton.
Source: The Norwegian Whaling Gazette, No. 4, 1965.

Fig. 1 - Japanese catcher boat towing a whale.

Japan (Contd.)

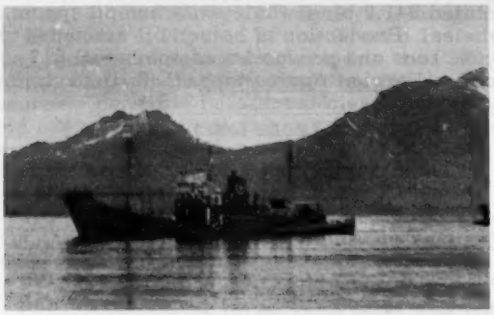

Fig. 2 - Japanese whale catcher in Bay at Leith Harbour, Japanese land station at South Georgia Island in the Antarctic.

Fig. 3 - Whale being hauled on shore at Leith Harbour.

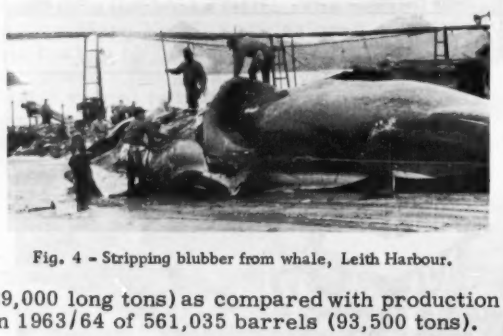

Fig. 4 - Stripping blubber from whale, Leith Harbour.

89,000 long tons) as compared with production in 1963/64 of 561,035 barrels (93,500 tons).

Sperm oil output in 1964/65 was 72,929 barrels (12,150 tons) as compared with production in 1963/64 of 120,093 barrels (20,000 tons).

The Japanese 1964/65 Antarctic whale catch totaled 4,125 blue-whale units. That was only 35 units short of the Japanese quota for 1964/65, but a decline of about 10 percent from the previous season's catch of 4,600 blue-whale units. (United States Embassy, Copenhagen, May 18, 1965.)

Note: See Commercial Fisheries Review, June 1965 p. 44, March 1965 p. 83, Oct. 1964 p. 49.

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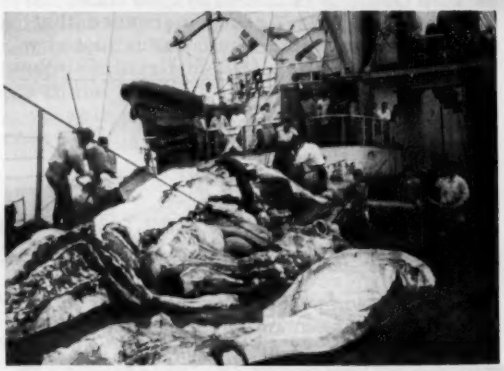
THREE WHALING FLEETS SAILED FOR NORTH PACIFIC IN MAY:

The three Japanese whaling fleets licensed to take whales in the North Pacific and Bering Sea sailed from Japan, May 20, 1965.

One fleet consists of the mothership Nisshin Maru No. 3 (23,405 gross tons) accompanied by 7 catcher and scout vessels (1 of which is listed as a "research-whale towing vessel") ranging from 622 to 758 tons. The fleet has a catch target of 1,640 sperm whales, according to previous reports.



Flensing a sperm whale aboard a Japanese whaling factoryship in the North Pacific.

Another fleet consists of the mothership Nichiei Maru (12,918) accompanied by the carrier vessel Nojima Maru (8,815 tons) and 7 catcher and scout vessels (1 listed as a "research-whale towing vessel") ranging from 470 to 753 tons.

The third fleet consists of the mothership Kyokuyo Maru (11,449 tons) accompanied by the tanker Kyokuyo Maru No. 2 (16,443 tons), the carrier vessels Kyokurei Maru (9,943 tons) and Koyo Maru (7,658 tons), and 7 catcher vessels ranging from 618 to 738 tons. According

Japan (Contd.):

to earlier reports, the catch target of the Kyokuyo Maru fleet is 534 blue-whale units (30 blue whales, 680 fin whales, and 1,200 sei whales).

The licenses of all three fleets expire December 31, 1965. (Fisheries Attache, United States Embassy, Tokyo, May 25, 1965, and other sources).

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FISH OIL PRODUCTION, 1956-1964:

Japanese estimated production of fish-body oil totaled 10,900 metric tons in 1964, a decline of 27 percent from 1963 due mainly to lower production of saury oil. Japanese production of saury oil has declined sharply from the high levels of the late 1950's.

Japanese Production of Fish-Body Oil, Liver Oil, and Squid Oil, 1956-1964

Type of Oil	1/ 1964	1963	1962	1961	1960	1959	1958	1957	1956
	(Metric Tons)								
Fish-Body Oil:									
Sardine	300	578	838	928	631	832	2,610	2,164	926
Herring	-	1	8	31	12	133	10	44	618
Atka mackerel	1,800	864	681	2,372	556	869	115	406	761
Saury	2,800	7,685	18,877	11,032	7,045	24,482	20,044	10,998	6,972
Flounder	-	73	100	171	280	413	476	510	685
Other fish-body oils	6,000	5,789	7,958	5,701	5,194	4,681	3,178	2,171	1,684
Total fish-body oil	10,900	14,990	28,462	20,235	13,718	31,410	26,433	16,293	11,646
Squid oil	1,000	2,663	3,181	2,967	2,720	4,871	4,056	4,170	3,470
Fish-Liver Oil:									
Cod & Alaska pollock	7,500	6,026	7,771	6,743	6,198	6,618	3,686	4,728	4,035
Shark	1,000	1,266	2,201	2,247	3,831	3,222	2,514	3,743	3,212
Other fish-liver oils	200	269	717	1,657	1,081	1,600	409	325	432
Total fish-liver oils	8,700	7,561	10,689	10,647	11,110	11,440	6,609	8,796	7,679
Grand total	20,600	25,214	42,332	33,849	27,548	47,721	37,098	29,259	22,795

1/Estimated.
Source: Japanese Ministry of Agriculture & Forestry.

Japanese estimated production of fish-liver oil in 1964 totaled 8,700 tons. That was a gain of 15 percent over the previous year due to greater production from cod and Alaska pollock. Japanese output of other fish-liver oils continued to decline in 1964. Squid oil production was also down. (Fisheries Attache, United States Embassy, Tokyo, May 28, 1965.)

Kuwait

SHRIMP VESSELS DELIVERED BY NORWEGIAN SHIPYARD:

A complete fishing fleet consisting of 8 specially built 90-foot shrimp trawlers, a 178-foot mothership, and a smaller special vessel was handed over to the Kuwait National Fishing Company by a Norwegian shipyard at Bergen in May 1965. On its trip to the Persian Gulf the fleet was manned by Norwegians.

The cost of the complete fleet was US$2.8 million, fully equipped with both navigational and fish-finding equipment and fishing gear. The Norwegian shipyard worked out the fisheries program for the Kuwait firm, planned the most suitable types of vessels for the Kuwait fisheries, designed them specially for that purpose, and handled the recruitment of Norwegian crews for them. Vessel captains are Norwegian and key crew positions are manned also by Norwegians.

The trawlers are 88 feet long and equipped with modern freezing equipment. The 800-ton mothership, which has a large freezing plant and ample cold-storage facilities, will receive the catch from the trawlers and pack it into larger units, with most of the production going to the United States market. (Press release of the Export Council of Norway and News of Norway, June 10, 1965.)

Note: See Commercial Fisheries Review, July 1964 p. 72.

Malaysia

FISHERY TRENDS, 1964:

Speaking at the launching of Malaysia's eighth combination fisheries research and patrol vessel on May 8, 1965, the Malaysian

Malaysia (Contd.):

Minister of Agriculture and Cooperatives announced that the total marine fisheries catch for the States of Malaya in 1964 was up 4.5 percent from 1963. He stated that 192,000 long tons of marine fish valued at M$162 million (US$53.1 million) were landed in Malaya in 1964, as compared with 183,630 tons worth M$157 million (US$51.5 million) in 1963. He also noted that in 1964 a total of 10,000 tons of fish were landed in Singapore and 20,000 tons in Sabah. There was no fisheries department in the State of Sarawak in 1964, but the Minister said that the Malaysian Government intended to establish an office there in 1965.

Discussing the recent decision to legalize trawling on a restricted basis, the Minister stated that his trip to Thailand in April 1965 had convinced him that it would be a "retrograde step" to continue the trawling ban. He cited the increased Thailand marine landings which have resulted from the use of trawlers (146,500 long tons in 1960 to 332,000 tons in 1963, or an increase of over 125 percent in 3 years).

The Minister said that he realized that the introduction of trawling would meet resistance from many fishermen. He compared trawling, however, to the introduction of "pukat jeroot" (purse-seine nets) on the east coast of Malaya. He said purse seining had been strongly resisted at first, but by 1964 a total of 34 vessels were using the nets in the State of Kelantan. Those vessels landed 35,000 piculs (4.6 million pounds) of fish or 30 percent of the total catch in Kelantan.

The Minister observed that expansion of fisheries was important to supply protein for the expanding population. He emphasized the need to meet Singapore's demand for fresh fish. He said that Singapore annually imported 31,000 long tons of fresh fish worth M$19 million (US$6.2 million), mainly from the States of Malaya, Thailand, and Vietnam. (United States Embassy, Kuala Lumpur, May 21, 1965.)

Notes: (1) Malaysian $3.05 equal US$1.00.
(2) See Commercial Fisheries Review, April 1965 p. 77; Aug. 1964 p. 67; Feb. 1964 p. 76.

Morocco

LONG-RANGE TUNA FISHING VENTURE CONTINUED:

A fleet of 7 small Moroccan vessels in early 1965 sailed over 2,000 miles from their home port of Agadir to fish for tuna as far south as the Ivory Coast. The venture may be a breakthrough in extending the limited range of Morocco's fishing fleet.

The vessels taking part in the expedition were 50 to 60 feet in length with a hold capacity for 30 to 50 metric tons of fish. That

Morocco (Contd.):

is a type of vessel normally used in the Moroccan sardine fishery.

For the tuna expedition, the vessels carried purse-seine gear, radiotelephones, electronic fish-finding equipment, and crews of 20 to 25 men.

The Moroccan expedition fished in coastal waters 20 to 36 miles offshore from Dakar (Senegal) and Conakry (Guinea); they also fished off Abidjan in the Ivory Coast. The fleet was said to have been unable to secure permission from Mauritania to fish off Port Etienne.

The total catch of the 7 Moroccan vessels in January-March 1965 was reported by La Vie Economique on April 9, 1965, as 360 metric tons (mostly tuna, mackerel, and anchovy).

By early June 1965, several vessels in the expedition had returned to Morocco, but two of the vessels were reported to be still fishing off Dakar, and others planned to return to Dakar to fish for tuna. (United States Embassy, Rabat, June 3, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 86.

New Zealand

GRANT AWARDED UNIVERSITY FOR PILCHARD RESEARCH:

A grant of £8,000 (US$22,300) from New Zealand lottery funds has been made to enable scientists from Victoria University to make a survey in Cook Strait to determine the feasibility of establishing a pilchard canning industry in Nelson. The survey is to be conducted by two faculty members of the University, one a biologist in applied fisheries and the other in zoology. It will be the first industrial research in the fisheries field carried out by any of the New Zealand universities.

The survey will be an extension of a study carried out by the New Zealand Marine Department in September 1964, after overseas firms had agreed to establish a canning industry in Nelson if competent biologists reported favorably on the availability of pilchards. The University biologist said the study had revealed considerable quantities of pilchards in the Cook Strait, Marlborough Sound, and Tasman Bay areas, but precise information was not obtained. He added that the study, however, was sufficiently promising to lead representatives of a British firm to have detailed talks with Nelson industrialists with a view to early establishment of a cannery.

Most of the grant would be taken up by the purchase of a specially designed research steel vessel, but about £1,700 ($4,700) would be used for gear, especially new types of nets, and about £1,000 ($2,800) would be used for aerial surveys. The research vessel was expected to be ready by early August 1965. (New Zealand Commercial Fishing, April 1965.)

Norway

COD FISHERY AS OF MAY 1965:

As of May 8, Norwegian cod landings in 1965 totaled 65,507 metric tons, of which 20,997 tons were sold for filleting, 23,280 tons for drying, 12,560 tons for salting, and 8,670 tons for marketing as iced fish. The catch also yielded 23,707 hectoliters of cod-liver oil. The Norwegian cod catch in the same period of 1964 totaled about 57,700 tons, of which 11,000 tons were sold for filleting, 23,100 tons for drying, 17,400 tons for salting, and 6,200 tons for marketing as iced fish; the catch yielded 23,214 hectoliters of cod-liver oil.

Norwegian vessel operating in the Lofoten cod fishery--sorting the catch.

As of May 29, Norwegian cod landings totaled 75,166 metric tons, of which 26,216 tons were sold for filleting, 26,817 tons for drying,

Norway (Contd.):

12,943 tons for salting, and 9,190 tons for marketing as iced fish. The Norwegian cod catch in the same period of 1964 totaled about 62,074 tons--13,143 tons were sold for filleting, 24,832 tons for drying, 17,705 tons for salting, and 6,394 tons for marketing as iced fish.

In late May 1965, the Finmark fishery for young cod off northern Norway was still yielding good results. Norway's Lofoten fishery for spawning cod ended earlier with a disappointing catch of only about 19,500 tons, or a decline of 4,100 tons from the 23,600 tons taken off Lofoten during the 1964 season. (Fiskets Gang, Nos. 16, 17, 18, and 19, and 22, 1965.)

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CANNED FISH EXPORTS, 1963-1964:

Norway's total exports of canned fishery products in 1964 were up about 10 percent in both quantity and value from 1963. The United States was Norway's most important market for canned fishery products, accounting for 36 percent of total shipments in 1964 and 42 percent in 1963. (Norwegian Canners Export Journal, April 1965.)

Note: See Commercial Fisheries Review, June 1964 p. 53.

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CANNED FISH EXPORTS, JANUARY-FEBRUARY 1964-1965:

Preliminary data show that Norway's total exports of canned fishery products in January-February 1965 were up about 10 percent from the same period of the previous year due mainly to larger shipments of smoked small sild.

Table 1 - Norwegian Exports of Canned Fishery Products by Type, 1963-1964

Product	January-December 1964			January-December 1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US$1,000	Metric Tons	1,000 Kroner	US$1,000
Smoked brisling in oil	5,768	38,562	5,386	4,793	32,785	4,579
Smoked brisling in tomato	1,278	6,978	975	575	3,175	443
Smoked small sild in oil	11,077	46,743	6,528	11,478	48,482	6,771
Smoked small sild in tomato	2,154	7,644	1,068	1,447	5,234	731
Unsmoked small sild in oil	379	1,321	184	869	2,812	393
Small sild packed otherwise	673	2,489	348	61	225	31
Kippered herring	3,264	14,370	2,007	3,149	13,442	1,877
Mackerel	745	3,606	504	666	3,117	435
Roe, unclassified	1,330	5,613	784	1,412	5,132	717
Soft herring roe	1,141	5,593	781	719	3,545	495
Fish balls	531	1,374	192	581	1,517	212
Other canned fish	100	739	103	162	1,212	169
Shellfish	1,603	16,393	2,289	1,545	16,486	2,303
Total	30,043	151,425	21,149	27,457	137,164	19,156

Table 2 - Norwegian Exports of Canned Fishery Products1/ by Country of Destination, 1963-1964

Country of Destination	January-December 1964			January-December 1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US$1,000	Metric Tons	1,000 Kroner	US$1,000
Finland	269	1,424	198	185	1,187	166
Sweden	925	4,330	604	396	2,036	284
Belgium-Luxembourg	669	3,232	451	649	3,124	436
Ireland	298	1,209	168	295	1,087	152
France	278	1,121	156	278	1,151	161
Netherlands	202	875	122	219	893	125
United Kingdom	6,626	32,243	4,503	4,859	21,608	3,018
West Germany	899	3,483	486	782	3,012	421
Czechoslovakia	1,089	3,871	540	2/	2/	2/
East Germany	1,276	4,322	603	1,479	5,295	739
South Africa Republic	1,740	6,950	970	212	981	137
Iraq	88	333	46	1,233	5,126	716
Canada	922	5,651	789	922	5,527	772
United States	10,479	56,021	7,824	11,900	61,597	8,603
Australia	2,144	8,858	1,237	1,947	7,150	999
New Zealand	466	2,004	279	503	2,144	299
Other countries	1,049	4,327	604	2,186	7,797	1,089
Total3/	29,419	140,254	19,588	28,045	129,715	18,117

1/Does not include exports of canned shellfish.
2/Data not available.
3/Totals are slightly different than the combined exports of canned fish (excluding shellfish) shown in table 1.
Note: Norwegian Kroner 7.16 equal US$1.00.

Norway (Contd.):

As of March 20, the 1965 Norwegian canned pack of kippered herring totaled 185,254 standard cases, compared with 203,827 standard cases in the same period of 1964.

Norwegian Exports of Principal Canned Fishery Products, January-February 1964-1965

	Jan. 1-Feb. 27 1965	Jan. 1-Feb. 29 1964
	(Metric Tons)	
Brisling	1,251	1,109
Smoked small sild	2,670	2,197
Kippered herring	486	508
Soft herring roe	16	40
Sild delicatessen	95	75
Shellfish	186	303
Other fishery products	332	332
Total	5,036	4,564

The 1965 pack of soft herring roe as of March 20 was 10,225 cases of $\frac{1}{2}$-ovals and 30,751 cases of $\frac{1}{4}$-oblongs, as compared with 16,561 $\frac{1}{2}$-ovals and 29,136 $\frac{1}{4}$-oblongs in the same period of 1964. (Norwegian Canners Export Journal, April 1965.)

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OPERATIONS OF LARGE FROZEN FISH PACKING FIRM:

In the 1950's an international firm set up a plant to pack frozen fishery products in the Norwegian port of Hammerfest, the northernmost city in the world. Annual production at that plant is now estimated at 8,000 metric tons of frozen fish fillets and 4,000 tons of other processed products such as fish balls, fish sticks, and fish cakes. Cod, haddock, and ocean perch are the main species handled. That pack is marketed all over Europe and even in the United States. The plant also produces about 6,000 tons of animal feed a year, most of which goes to Sweden and Finland.

The company owns 7 modern trawlers and has under annual charter another 15 trawlers of 300 to 500 gross tons. About 600 fishermen work on those 22 trawlers and supply over half of the company's requirements for raw fish. The remainder is supplied by coastal fishermen using smaller vessels.

Quality control is emphasized in all phases of the Hammerfest operation--from fishing to marketing. As soon as fish are caught they are gutted, rinsed, and stowed in ice. Upon landing at Hammerfest, the catch is immediately started on its way through production lines after grading (by an examination of 10 percent of each trawler load) and hand sorting. Processing is speeded by filleting and skinning machines. Daily production of frozen fillets amounts to about 140 tons or 140,000 consumer packages.

A total of 800 workers are employed in the plant. That includes 500 women production workers who work on a piece-rate basis. Their average hourly earnings are 7 to 9 kroner (US$0.98 to 1.26).

The Hammerfest operation is considered to be a success and plans for similar operations in other fisheries centers of northern Norway have been reported. (United States Embassy, Oslo, June 10, 1965.)

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EXPORT OF FISHING VESSELS EXPANDED:

Norway has been rapidly expanding its export business in fishing vessels and equipment, as well as fishery training, and has for some years been building fishing vessels for countries in Asia, Africa, Latin America, and Europe.

Norway's role as an exporter of fishing vessels and fishery training to other countries started with a development aid project in Kerala State in India where she has been active for more than 10 years in teaching modern fishing methods and supplying equipment. Later, Norwegians helped in building a modern fishing industry in Pacific Coast nations of Latin America and were also active in the modernization of the Philippine fisheries. So far, Norway has built two fishing vessels for the Philippines.

Norwegians also have a part in developing the fishing port of Shama in Ghana, with one shipyard now building 7 stern trawlers (231-feet long) for that country. Fishing vessels are also being built for Israel and Scotland (Fair Isles).

Iceland is Norway's biggest foreign customer for fishing vessels. Two Norwegian shipbuilding sales organizations delivered 17 vessels to that country. A third shipbuilding group had not yet released its 1964 export data on fishing vessels for Iceland, but in 1963 sold that country $4.5 million worth of fishing vessels.

Norwegian shipyards are working actively on the international market and look for more orders for completely equipped fishing fleets for other countries in the Middle East, in Lat-

Norway (Contd.):

in America, and other parts of the world. (Press release of the Export Council of Norway.)

Note: See Commercial Fisheries Review, May 1965 p. 67; January 1965 p. 72; August 1964 p. 65.

Pacific Islands

FISHERIES TRENDS, EARLY 1965:

Cultured Pearls: The first cultured pearls to be produced in French Polynesia have raised hopes of a new and profitable industry for the islands. The pearls were produced at Bora Bora in the Society Islands and are 10 to 14 millimeters (half an inch or thereabouts) in diameter.

Le Journal de Tahiti describes them as "perhaps the most beautiful in the world." It says their tones, varying from black to green to rose, are "excessively rare in cultured pearls."

Attempts to cultivate pearls in French Polynesia at Bora Bora and Hikueru Atoll in the Tuamotus--have been under way since July 1962 with Japanese know-how and money from FIDES, a French aid scheme.

Meanwhile, in New Guinea, a small raft anchored in a quiet backwater of Port Moresby's Fairfax Harbor is the key to another experiment in pearl production. The raft was anchored there by an Australian company which has successfully been producing cultured pearls by Japanese methods in the Torres Strait off Queensland and in Western Australia at Kure Bay.

Local oysters are suspended from the Port Moresby raft in baskets. Every 6 months their growth will be checked. After 12 months it may be possible to see whether the industry will be a paying proposition for the Territory. Production would take 2 or 3 years.

Australian-Japanese Fishing Venture Proposed for Papua-New Guinea: An Australian businessman from Brisbane hopes to set up a Ł250,000 (US$556,000) fishing enterprise in Papua-New Guinea with the aid of Japanese labor and capital, according to a news service report.

If he gets approval from the Australian Government, the Brisbane businessman plans to bring three 60-foot Japanese fishing trawlers to work in Papua's Gulf District. The vessels would be manned entirely by Japanese crews.

About 45 percent of the capital invested in the venture would be Japanese. The project includes plans to build wharves in Port Moresby and freezing and processing facilities for the catch, and later a cannery. (Pacific Islands Monthly, March and April 1965.)

Poland

TUNA CANNING EXPERIMENTS:

In connection with plans to begin fishing for tuna, a Polish plant at Gdynia has carried out tuna-canning experiments with imported fish. Good results were reported. (Polish Maritime News, April 1965.)

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FISHERIES EXPANSION PLANNED IN 1966-1970:

Poland's largest fishing cooperative, "Dalmor" of Gdynia, is scheduled to catch an overall total of 714,000 metric tons of fish over the period from 1966 to 1970. In 1970 Dalmor's annual catch is to total 174,000 tons, as against 117,000 tons to be landed in 1966. By the end of 1970 Dalmor is to own a fleet comprising 26 factory trawlers, 4 freezer trawlers, 4 tuna vessels, and about 30 steam trawlers.

The "Gryf" Deep-Sea Fishing Cooperative of Szczecin is scheduled to have 68 vessels and catch about 67,000 tons of fish in 1970. (Polish Maritime News, April 1965.)

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NEW FISHING VESSEL DESIGNS:

The Polish Ships Design Office ("Bekatemor") has worked out new designs for a 17-meter (56-foot) cutter to use ring nets, a 25-meter (82-foot) cutter to employ trawl and ring nets, and a 30-meter (98-foot) cutter to fish with trawls in African and South American waters. The office has also adapted the 27-meter (86-foot) stern cutter to use trawls. (Polish Maritime News, April 1965.)

Portugal

CANNED FISH INDUSTRY OUTLOOK FOR 1965:

Portuguese carryover stocks of canned sardines in oil at the beginning of 1965 were estimated at about 2 million cases of "¼ club" cans. (The 1964 Portuguese canned fish pack in oil included a record sardine pack of 70,209 metric tons and 15,423 tons of other species, as compared with the 1963 pack of 49,644 tons and 20,776 tons, respectively.) Export shipments of canned sardines were moving well in early 1965 in spite of the rather large carryover.

Only moderate carryovers were reported for other Portuguese canned fish items in oil (chinchards, mackerel, tuna, and anchovy), so 1965 exports of those items will depend on the size of the pack this year.

In 1964 Portuguese canners raised prices for their pack of skinless and boneless sardines. This year the Portuguese Canned Fish Packers Association is reported to be considering plans to set up a minimum price system in order to eliminate the wide price fluctuations which have occurred in the past.

Portuguese exports of canned fish in oil in 1964 totaled 69,935 tons valued at conto 1,174,195 (US$40.9 million) as compared with 71,076 tons in 1963 valued at conto 1,105,149 ($38.5 million). The increase in value in the face of a small decline in shipments reflects the price increases of 1964. (Conservas de Peixe, April 1965.)

South Africa Republic

PELAGIC SHOAL FISH CATCH, FIRST QUARTER 1965:

South Africa's Cape west coast shoal fish catch for the first 3 months of 1965 was 146,646 short tons pilchards, 19,874 tons maasbanker, 24,287 tons mackerel, and 15,517 tons anchovy. The total catch was 207,324 tons. In the same period of 1964 the total catch was 205,247 tons, made up of 168,060 tons pilchards, 9,443 tons maasbanker, and 27,744 tons mackerel.

The January-March 1965 catch yielded 49,442 short tons of fish meal, 2,211,523 gallons of fish body oil, 2,098,824 pounds of canned pilchards, 2,960,592 pounds of canned maasbanker, and 4,840,296 pounds of canned mackerel.

In the Territory of South-West Africa, all 7 of the pilchard-processing factories at Walvis Bay had started operations by the end of February 1965. The shoal catch landed at Walvis Bay in January-March 1965 totaled 130,666 tons and consisted of 130,422 tons pilchards and 244 tons anchovy.

South Africa's Cape west coast shoal fish catch for the first two months of 1965 was 51,602 short tons pilchards, 18,065 tons maasbanker, 12,275 tons mackerel, and 15,503 tons anchovy. The total catch was 97,445 tons. In the same period of 1964 the total catch was 130,640 tons, made up of 111,210 tons pilchards, 9,437 tons maasbanker, and 9,993 tons mackerel.

The January-February 1965 catch yielded 22,844 short tons of fish meal, 863,242 gallons of fish body oil, 1,643,976 pounds of canned pilchards, 2,635,392 pounds of canned maasbanker, and 1,971,384 pounds of canned mackerel.

In the Territory of South-West Africa, all seven of the pilchard processing factories at Walvis Bay had started operations by the end of February 1965. Their early catches were taken close inshore and yielded about 8 to 12 gallons of oil per ton of fish. (The South African Shipping News and Fishing Industry Review, March, April, May 1965.)

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WORLD FISH MEAL MARKET TRENDS CAUSE CONCERN:

The uncertainties surrounding the world market for fish meal are causing some concern among producers in the South Africa Republic. The main concern is that world supplies will not satisfy world demand in 1965. Such a shortage would raise prices, but it could also lead to some disturbing long-term developments. The South African Shipping News and Fishing Industry Review, May 1965, published the following report on the situation:

For some years there have been attempts to find substitutes for the protein in fish meal, or to synthesize some of the more important amino acids. One of the projects has aimed to produce a protein as a byproduct of the

South Africa Republic (Contd.):

petroleum industry. The project has produced preliminary samples which are neutral in taste and have a biological value equal to that of yeast. Fish meal is of course superior as a protein source. The petroleum project is still being developed and difficulties in the fish meal market would stimulate the experiments.

Another result of a shortage of fish meal might be in the use of smaller proportions in animal feeds. Already some feed manufacturers have cut the proportion to $2\frac{1}{2}$ to 3 percent. Such a development could of course be seen as healthy progress towards the more efficient use of meal. But some producers may also see it--with the experiments in substitutes--as a warning that fish meal may be more difficult to sell in the future.

The growth of world trade in fish meal is one of the more remarkable events of recent years. In 1948 statistics compiled by the Food and Agriculture Organization showed total world fish meal exports of only 110,000 metric tons; 10 years later exports had risen to 657,000 tons. Then came the explosive growth of anchoveta fishing off Peru. By 1961 world exports had soared to 1,351,000 tons; in 1963 they totaled 1,769,000 tons; and in 1964 they were more than 2 million tons.

The sharp rise in available meal sent prices tumbling in the early 1960's. But the lower prices helped spread fish meal to more users and more importing countries. It proved a boon to the animal feed industry, took some of the pressure out of efforts to synthesize the protein (or some of the constituent amino acids) provided by fish meal, and eventually helped to place the market for fish meal on more solid foundations.

Now, stability in the fish meal market is again threatened--this time by a possible shortage rather than a surplus.

Under the circumstances, it would be timely to consider increasing production in South Africa to offset possible declines in output in South America.

A total catch of 1.2 million short tons of shoal fish in the South Africa Republic in 1964 yielded 284,000 short tons of meal. A decline in Cape production was more than balanced by an increase in the catch permitted in South-West Africa.

Under current fishing regulations, South African fish meal output in 1965 should be about the same or less than last year. However, if quotas were raised, more fish could be caught quite easily in South-West Africa, and perhaps also in South Africa if it was decided to extend the Cape season for anchovy.

What should also be considered is whether another 200,000 tons of pilchards added to the 1965 South-West Africa quota would endanger the resource, and whether this danger is sufficient to offset the benefit of the extra meal to the economy, to the industry, and to the future of the fish meal trade.

After calling for more fisheries research to clarify the South African fisheries potential, the South African Shipping News and Fishing Industry Review concluded with the statement: "Fisheries research is still so neglected that those who impose controls over the shoal catch continue to grope blindly never knowing the effect of fishing on the resource. In fact, conservation control is no more than the stop-go apprehensive stumble of a blind man learning to walk with a stick--a careful prod forward, a pause, and then another prod. It seems unfortunate that the pause period should fall in a critical year for the fish meal industry. We can only hope that it will be decided before the end of 1965 to try another prod forward."

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RECORD FISHERIES CATCH IN 1964:

Record fisheries catch in the South Africa Republic (includes the Territory of South-West Africa) continued in 1964 when the total exceeded the 1,265,000 short tons of 1963 by more than 100,000 tons to reach a figure of 1,379,309 tons. That was the 7th year in succession that the catch has set a new record, and the 1964 total was nearly double the 724,000 tons of 1958 when the record-breaking run started.

In South-West Africa, the 1964 catch totaled a record 735,775 tons and included an estimated 2,000 tons of white fish, 2,000 tons of snoek, 8,000 tons of spiny lobster, 718 tons of anchovy, and 723,057 tons of pilchards.

In the rest of the South Africa Republic the catch was 643,534 tons of pilchards, maasbanker, mackerel, anchovy, hake and other trawled fish, spiny lobster, snoek, line fish, and tuna. That total was just below the 651,000

South Africa Republic (Contd.):

tons of 1963 and was well below the 725,000 tons of 1961.

In the Cape west coast shoal fishery, anchovy (at 104,630 tons) partly made up for the drop in the pilchard catch to 282,301 tons and brought the shoal fish catch to 471,578 tons. The trawl fish catch improved slightly over that of 1963 and reached 117,756 tons. The spiny lobster catch was estimated at 12,200 tons, line fish at 30,000 tons, snoek at 8,000 tons, and tuna at 4,000 tons. (The South African Shipping News and Fishing Industry Review, April 1965.)

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ANCHOVY FISHING REGULATIONS ISSUED:

Following the successful anchovy fishery off the Cape west coast in 1964, that species was covered in new fisheries regulations published by the South Africa Republic in Government Gazette, February 26, 1965.

Regulations governing the pilchard fishery have been extended to anchovy so that both species are now subject to a closed season on the Cape west coast from August 1 to December 31. (The closed season for maasbanker and mackerel is from August 1 to October 31.)

Anchovy was also included with pilchards, maasbanker, and mackerel in regulations covering the licensing of canneries and fish meal plants to process those species. (The South African Shipping News and Fishing Industry Review, March 1965.)

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NEW LICENSES EXPAND FISH-MEAL CAPACITY ON THE CAPE:

Press reports have indicated that the South African Government planned to grant 3 new fish meal licenses in 1965 thereby increasing the number of Cape fish meal factories from 14 to 17 and their total raw fish capacity from 270 to 320 short tons an hour.

In early March 1965, although official confirmation was lacking, South African newspapers announced that two companies, previously unknown in the fishing industry, had been allowed a concession to catch pelagic fish off the Namaqualand coast and to process fish meal in a factory at Port Nolloth. Their license was said to be for 15 tons of raw fish an hour.

According to a report in the South African Financial Mail, a 10-ton license was to be granted to a company formed by a group of Cape fishermen and professional men, and a 25-ton license was to be divided equally between existing fish meal producers and a number of fisheries men operating along the west coast and around to Hermanus.

An increase in fish meal plant capacity on the Cape may be of little value unless it is matched by an increase in fishing capacity. The fleet of about 130 licensed shoal vessels was hard put to provide for 14 fish meal factories in 1964 during the 7 months pilchard season from January until the end of July. In the first 2 months of 1965 the Cape pilchard catch was less than 60,000 tons as compared with 111,210 tons in the same period of 1964. These trends indicate that 20 or 30 shoal vessels might be needed to support any expansion in productive capacity. (The South African Shipping News and Fishing Industry Review, April 1965.)

U. S. S. R.

ANTARCTIC WHALE OIL AND SPERM OIL PRODUCTION, 1964/65 SEASON:

Total marine oil production from Soviet whaling in the Antarctic during the 1964/65 season was down about 13 percent from the previous season.

Soviet Antarctic Production of Whale Oil and Sperm Oil by Whaling Fleets During the 1964/65 Season[1]

Whaling Fleets	Whale Oil	Sperm Oil	Total Whale and Sperm Oil
	(Barrels[2])		
Juri Dolgor	39,371	29,588	68,959
Slava	21,765	50,651	72,416
Sov. Ukraina	64,958	57,929	122,887
Sov. Rossia	47,376	22,029	69,405
Total all fleets	173,470	160,197	333,667

1/Preliminary.
2/Six barrels equal one long ton.
Source: The Norwegian Whaling Gazette, No. 4, 1965.

Soviet whale oil output from the 1964/65 Antarctic catch totaled 173,470 barrels (about 28,900 long tons) as compared with production in 1963/64 of 214,438 barrels (35,700 tons).

U.S.S.R. (Contd.):

Sperm oil output in 1964/65 was 160,197 barrels (26,700 tons), as compared with 167,715 barrels (27,950 tons) in the previous season. (United States Embassy, Copenhagen, May 18, 1965.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 49.

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SOVIETS DEVELOP SMALL "SUBMARINE HYDROPLANE" TO OBSERVE FISHING GEAR:

To make underwater observations of trawls and the reaction of fish to gear, the Soviet Institute of Fishery and Oceanological Research has built a "submarine hydroplane." The 1-man underwater craft is designed to be towed by a surface vessel. It has been tested successfully in the Mediterranean and the Atlantic off Africa where a Soviet engineer has made dives to a depth of 75 meters (246 feet). He reported that trawls showed up quite clearly at those depths and that no difficulty was experienced in obtaining film records at depths of 50 to 75 meters (164 to 246 feet), even without the use of light projectors installed on the craft.

The Soviet engineer who made the test dives says his colleagues have nicknamed him "Hydronaut No. 1." (World Fishing, April 1965.)

United Kingdom

UNITED STATES DEMAND FOR EUROPEAN FISH VERY BIG SAYS BRITISH EXECUTIVE:

Shortly after his return in May 1965 from America, where he had been buying and selling fish, the British managing director of a large fisheries firm in Hull discussed the United States market.

"There is a very big demand for European fish in America," he said. "The problem is more one of quality and suitability rather than of price. . . They are looking more and more to the world picture for their supplies, rather than simply to their own domestic fishing which is not developed on the scale of various European countries."

He pointed to a large and expanding population as the big factor behind the U. S. demand.

Commenting on arrangements he had been making for contracts in North America, the British executive said that his exports would be frozen groundfish. So far as the imports were concerned, he said substantial contract arrangements would be entered into for frozen fish supplies from North America. These would include halibut, salmon, fillets, and shellfish from the East and West Coasts.

The British executive attended the North American Fisheries Conference while he was in the United States. (Fishing News, London, May 14, 1965.)

* * * * *

BOXING FISH AT SEA IMPROVES QUALITY:

Keeping time is increased by 1 to 3 days when fish are boxed at sea rather than stowed in bulk or shelved. That was the conclusion of the British White Fish Authority after small-scale tests in 1964 by the Torry Research Station. Results equally as good were achieved during commercial tests with boxed fish aboard the trawler Summervale in the spring of 1965. After one trip during the test, the vessel returned with a catch of 44,800 pounds packed in specially designed boxes. (Fish Trade Gazette, April 24, 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 114, and March 1964 p. 73.

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NEW SEMIAUTOMATED STERN TRAWLER "ROSS FORTUNE" LAUNCHED:

The Ross Fortune was launched June 15, 1965, at a shipyard in Selby, England, for the British firm which pioneered semiautomated trawling in the North Sea with the Ross Daring. The Ross Fortune and her sistership Ross Fame will extend automation to middle-distance fishing. British middle-water vessels usually carry about 15 men, but Ross Fortune will start operations with a crew of only 10 men.

Ross Fortune is a shelter-deck stern trawler with an overall length of 139½ feet, a breadth moulded of 30 feet, and a depth moulded to upper deck of 19½ feet. Fish hold capacity is 8,500 cubic feet representing space for about 100 long tons of fish on shelves. Power is provided by an engine developing 950 b. hp. at 1,500 r.p.m.

When completed in the fall of 1965, Ross Fortune will operate out of Grimsby, England.

Note: See Commercial Fisheries Review, March 1965 p. 94.

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United Kingdom (Contd.):

NEW SEMIAUTOMATED STERN TRAWLER "ROSS DAINTY" ENTERS SERVICE:

A major feature of the Ross Dainty, which entered service in late May 1965, is push-button control from the bridge of every fishing operation. It also provides automatic bridge control of the main engine, propeller pitch, pumps, and gearbox clutch. The vessel is the first of two additional "Daring" class semiautomated stern trawlers ordered by a large British trawling firm.

Fig. 1 - Ross Dainty, the most recent British semiautomated stern trawler.

Ross Daring and her sistership Ross Delight (both launched in 1963) pioneered semiautomated stern trawling in the North Sea. Each of those vessels has a length between perpendiculars of 85 feet, a range of about 30 days, and a fishhold capacity for about 140,000 pounds of iced fish. Each is worked by a crew of five men.

Fig. 2 - Ross Daring pioneered semiautomated stern trawling.

The Ross Dainty incorporates the basic design of the Ross Daring with improvements developed through extensive trials of the earlier vessels. Changes in the Ross Dainty include an all-welded construction and fabricated stern frame; a length between perpendiculars of 86 feet 3 inches; and a slightly larger fishroom (5,000 cubic feet) covered with galvanized steel instead of aluminum.

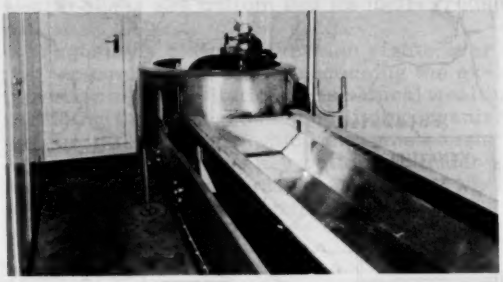


Fig. 3 - The gutting and washing room on the Ross Daring. After fish are sorted on deck, they are passed through a hatch for gutting in the stainless steel trough in the foreground. Fish are then washed and transferred by chute to the fishroom below.

The Ross Dainty is powered by a 4-stroke diesel engine developing 407 s. hp. at 1,200 r.p.m.

Note: See Commercial Fisheries Review, March 1965 p. 94, and Sept. 1963 p. 93.

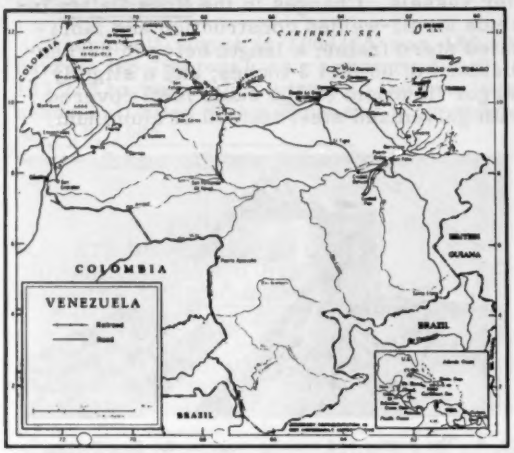
Venezuela

FISHERIES INVESTMENT OPPORTUNITY:

A Venezuelan firm is seeking a joint venture to establish a smoked fish operation using Venezuelan species of tropical fish to produce a smoked herring-type product. According to the firm, laboratory tests combined with the experience of three small plants have shown that two species of fish termed "Cabana" and "Cataco," when smoked with local wood, have the taste and appearance of smoked herring. Those fish are captured in the nets of Venezuelan sardine purse seiners within 2 miles of shore. Fishermen are currently discarding the "Cabana" and "Cataco."

The project calls for a smoking plant with an initial capacity of 2 metric tons of raw fish a day. Calculating a 50 percent loss in weight, the weekly output would be about 5 to 7 tons. About 50 percent of the initial production would have to be sold in foreign markets. The smoking plant could probably be financed locally, and it would be located near the source

Venezuela (Contd.):



of supply at one of three fishing centers in Venezuela.

A U. S. collaborator would be asked to supply fishing know-how and to bring into the company, for operation under the Venezuelan flag, an appropriate fully equipped fishing vessel. While the fish presently can be bought for a penny each from local fishermen, the company believes that when it begins production it should have its own boat in operation to insure an adequate supply of the required fish at competitive prices.

Note: Interested U. S. investors should write: Christian Pfeiffer, Americana Valor S.A., Edificio Galipan, A-2-F, Avenida Francisco de Miranda, Caracas (Apartado 11491 Chacao), Venezuela. A World Trade Directory report on the firm, dated March 31, 1965, may be obtained by qualified United States firms from U. S. Department of Commerce field offices for $1.00 a copy.

Republic of Viet-Nam

FROZEN SHRIMP EXPORTS, 1964:

South Viet-Nam's exports of frozen shrimp during January-March 1965 were up from the same period a year earlier. In 1964 South Viet-Nam exported less frozen shrimp than in the previous year--732,000 pounds as compared with more than 1 million pounds in 1963.

In 1964 the United States received 77,000 pounds of that country's frozen shrimp exports. In the first quarter of 1965 the United States imported 26,000 pounds of frozen shrimp from South Viet-Nam, the same quantity as in the first quarter of 1964.

With the completion of additional fish landing facilities in that country, fishery products exports (including shrimp) are expected to increase. Trial shipments of frozen shrimp for market testing were made in 1964 to the United States, Europe, and Asiatic countries. (United States Embassy, Saigon, May 20, 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 96.

Yugoslavia

NEW LAW PROCLAIMS EXTENDED TERRITORIAL WATERS AND CONTROL OVER ADJACENT CONTINENTAL SHELF RESOURCES:

A decree proclaiming a "Law on the Coastal Sea, The Outer Sea Belt, and the Epicontinental Belt of Yugoslavia" was published in the Yugoslav Official Gazette of SFRY, May 12, 1965, and became effective on May 20, 1965. The new law proclaims Yugoslav sovereignty over the "coastal sea of Yugoslavia" which includes "inner sea waters" and "the territorial sea." Base lines are set forth to be used in measuring those areas. The "inner sea" is within the base lines and the "territorial sea" is a belt of 10 nautical miles measured from the base lines toward the open sea.

The base lines specified are: (1) the low-tide lines along the coastline of the mainland and coastal islands; (2) straight lines closing the entrances to bays; and (3) straight lines connecting certain points on the mainland and coastal islands.

The law provides that a foreign fishing vessel while passing through the Yugoslav "territorial sea" must "keep her fishing equipment in the holds or sealed. Such a vessel must pass through the territorial sea by the shortest route, sailing at a speed not lower than the economic speed, without stopping or anchoring, unless this is necessary due to an act of God. During her passage through the territorial sea a foreign fishing vessel must bear clearly visible markings indicating a fishing vessel." The penalty provided for violation of those provisions is a fine of 20,000 to 200,000 dinars (US$27 to $267). Those provisions do not apply to a fishing vessel which has been granted permission, issued on the basis of an international agreement, for fishing in the "territorial sea," when such vessels are in the zone where they are allowed to fish.

Yugoslavia (Contd.):

Foreign fishing vessels are generally forbidden to enter Yugoslavia's "inner sea waters" unless forced there by an act of God. The penalty for such a violation is a fine of 50,000 to 500,000 dinars ($67 to $667) and is applicable to the captain of the vessel or any other responsible person aboard.

The new law prescribes an "outer sea belt" of 2 nautical miles measured from the outer boundary of the "territorial sea." In the "outer sea belt" competent Yugoslav authority is to "exercise control to prevent violation of customs, fiscal, and sanitary regulations. . . and to punish breaches of these regulations."

The "epicontinental belt" is described as "the sea bottom and the underground of the submarine space outside the outer boundary of the territorial sea to a depth of 200 meters (656 feet), and also beyond that boundary to the line where the depth of the water over the sea bottom permits exploitation of the natural wealth of the sea bottom and its underground."

Yugoslavia claims sovereign rights over the "epicontinental belt" concerning the exploration and exploitation of its natural wealth--including its underground and living organisms which, in the stage in which they are caught, are immovable on the sea bottom or underneath the sea bottom, or can move only when in continual, physical contact with the sea bottom or its underground.

AUSTRALIAN SHRIMP TRAWLER NETS RARE "BARKING" SPINY LOBSTER

A total of 22 unusual spiny lobster caught by the shrimp trawler Century Star, the latter part of 1964 in 65 fathoms of water 25 miles off Mooloolaba, Queensland, have been identified as "barking crayfish" (Linuparus trigonus). Previously they were recorded only twice in Australia.

The first example of the species (which belongs to the Japanese seas) recognized in Australia was taken in the net of a steam trawler in 65 fathoms off Botany Bay, New South Wales in 1949. Another specimen was netted in 50 fathoms of water, 16 to 18 miles off Newcastle, in 1956. Up until 1949 the only other record of the species being found outside Japanese waters was when a single specimen was trawled off Portuguese East Africa, in 180 fathoms of water.

The common name of "barking crayfish" was given to Linuparus trigonus by F. A. O'Neill in the June 1956 issue of the Australian Museum Magazine when he examined a live specimen caught off Newcastle.

When the spiny lobster flexed its tail and threw its pair of heavy antennae backwards over its head, the movement was accompanied by a loud harsh grating sound or "bark."

The source of the noise was later found to be the inner angles of the heavy basal joints of the stubby antennae, just in front of the eyes. Here there were two smooth-lined cavities which enclosed and bore upon a pair of highly-polished bosses when the antennae assembly was thrown backwards over the head. Even after death a semblance of this friction-produced sound could readily be produced by hand manipulation. (Australian Fisheries Newsletter, November 1964.)

FEDERAL ACTIONS

Department of the Interior

FISH AND WILDLIFE SERVICE

HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Joseph & Lucia, Inc., Gloucester, Mass., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 99-foot overall steel vessel to engage in the fishery for groundfish, lobster, and whiting. A hearing on the economic aspects of this application was held on July 20, 1965, in Washington, D. C. The U. S. Bureau of Commercial Fisheries published the notice of the application and hearing in the Federal Register, June 16, 1965.

Captain Ahab, Inc., New Bedford, Mass., has applied for a fishing vessel construction differential subsidy to aid in the construction of an 88-foot overall steel vessel to engage in the fishery for scallops, groundfish, lobster, and swordfish. A hearing on the economic aspects of this application was held on August 3, 1965, in Washington, D. C. Notice of the application and hearing appeared in the Federal Register, June 25, 1965.

Five applications for fishing vessel construction differential subsidies to aid in the construction of 144-foot overall steel vessels have been received from firms in San Diego, Calif. The firms are Gina Karen Fishing, Inc.; Hope Fishing, Inc.; Lou Jean II Fishing, Inc.; Marilyn M. Fishing, Inc.; and Vivian Ann Fishing, Inc. Each of those firms has separately applied for a subsidy to build its own vessel to engage in the fishery for tuna and tuna-like fish, for demersal fish such as flounder, hake, redfish, and pollock in the Pacific Ocean, for crab and shrimp in the Pacific Ocean, and for pelagic fish such as anchovies and jack mackerel. A hearing on the economic aspects of those applications was held on August 10, 1965, in Washington, D. C. Notice of the hearing and applications was published in the Federal Register, July 3, 1965.

Note: See Commercial Fisheries Review, May 1965 p. 98; Apr. 1965 p. 92.

BUREAU OF COMMERCIAL FISHERIES

INTERIM AMENDMENT TO U. S. STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP:

The U. S. Bureau of Commercial Fisheries has received a number of comments on the proposed amendments to Title 50, Code of Federal Regulations, Part 262--United States Standards for Grades of Frozen Raw Breaded Shrimp, published in the Federal Register, March 18, 1965. In view of the numerous comments it would not be in the public interest at this time to adopt the proposed amendments to Part 262.

Instead an interim amendment was adopted and became effective on publication in the Federal Register, June 5, 1965. The interim amendment is only a technical modification designed to bring Part 262 into conformity with the Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp (published in the Federal Register, March 5, 1965, by the Food and Drug Administration).

The only effect of the interim amendment is to prescribe a method of determining shrimp content which allows a correction factor of 2 percent.

The interim amendment is only a temporary modification. After all comments concerning the proposed notice of rule making which was published on March 18 have been received and given full consideration, a new, comprehensive, and revised Part 262 will be adopted.

The interim amendment as published in the June 5, 1965, Federal Register follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND PROCESSED FOOD PRODUCTS

PART 262—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP

Definitions and Methods of Analysis

On March 5, 1965, the Food and Drug Administration published in the FEDERAL REGISTER (30 F.R. 2860) Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp (21 CFR 36). Particular sections of these Definitions and Standards of Identity become effective 90 days after publication. On March 18, 1965, the Department of the Interior published in the FEDERAL REGISTER (30 F.R. 3598) a notice of proposed rule making to amend Part 262 of Title 50 of the Code of Federal Regulations. Interested persons were given 30 days in which to submit comments upon the proposed amendments to Part 262. Due to the numerous comments submitted to the Department by interested persons, it would not be in the public interest at this time to adopt the proposed amendments to Part 262 as published.

Accordingly, notice is given that pursuant to the authority vested in the Secretary of the Interior by sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, as amended, it is proposed to adopt an interim amendment to Part 262 in order to bring Part 262 into conformity with the Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp. This amendment to Part 262 is only a temporary and technical modification of Part 262. After all comments concerning the proposed notice of rule making, which was published on March 18, have been received and given full consideration, a new, comprehensive and revised Part 262 will be adopted.

Since the breaded shrimp industry must comply with certain mandatory requirements of the Definitions and Standards of Identity for Frozen Raw Breaded and Lightly Breaded Shrimp beginning June 3, 1965, and since this amendment achieves technical conformity of Part 262 with the Definitions and Standards of Identity regarding the calculation of the percent of shrimp material, notice and public procedure thereon have been deemed unnecessary and impracticable.

§ 262.21 Definitions and methods of analysis.

• • • • •

(i) *Percent shrimp material.* • • •

(2) • • •

(ii) Calculate percent shrimp material:

$$\text{Percent shrimp material} = \frac{\text{weight of debreaded sample}}{\text{weight of sample}} \times 100 + 2$$

• • • • •

These regulations shall become effective upon publication in the FEDERAL REGISTER.

(Sec. 6, 70 Stat. 1122; 16 U.S.C. 742a; secs 203, 205, 60 Stat. 1087, 1090, as amended; 7 U.S.C. 1622, 1624)

JOHN A. CARVER, Jr.,
Under Secretary of the Interior.

JUNE 3, 1965.

Note: See Commercial Fisheries Review, June 1965 p. 82.

* * * * *

U. S. INSPECTION AND CERTIFICATION PROCEDURES FOR FISHERY PRODUCTS MODIFIED BY MINOR TECHNICAL AMENDMENTS:

Minor technical amendments to Title 50, Code of Federal Regulations, Part 260--Inspection and Certification, and Part 266--U. S. Standards for Grades of Frozen Raw Breaded Fish Portions, became effective on publication in the Federal Register, June 2, 1965, as follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 260—INSPECTION AND CERTIFICATION

PART 266—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED FISH PORTIONS

Miscellaneous Amendments

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, as amended, and of the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of 1956, as amended, it is proposed to adopt amendments to Part 260—Inspection and Certification, and Part 266—U.S. Standards for Grades of Frozen Raw Breaded Fish Portions as set forth below. The features of these amendments are to delete the words sirup, sirup density, and viner refuse, where they appear in Part 260; to add the letters "U.S." to an approved inspection mark illustrated as Figure 5 in Part 260; and to substitute the words "uniformly shaped" for the word "rectangular-shaped" in Part 266.

Inasmuch as these amendments involve minor technical changes in Title 50, notice and public procedure thereon have been deemed unnecessary and the amendments shall become effective upon publication in the FEDERAL REGISTER.

In Part 260—Inspection and Certification:

1. In § 260.6, item (b) (1) of *Inspection service* is amended to read as follows:

§ 260.6 Terms defined.

• • • • •

Inspection service. • • •

(b) • • •

(1) Essential characteristics such as style, type, size, or identity of any processed product which differentiates between major groups of the same kind;

• • • • •

2. Section 260.23 is amended to read as follows:

§ 260.23 Postponing inspection service.

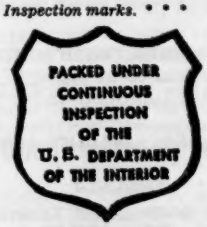
If the inspector determines that it is not possible to accurately ascertain the quality or condition of a processed product immediately after processing because the product has not reached equilibrium in color, or drained weight, or for any other substantial reason, he may postpone inspection service for such period as may be necessary.

3. In § 260.86, paragraph (b), figure 5 is amended as set forth below:

§ 260.86 Approved identification.

• • • • •

(b) *Inspection marks.* • • •



Statement enclosed within a shield.

FIGURE 5.

• • • • •

4. Section 260.98(b) is amended to read as follows:

§ 260.98 Premises.

• • • • •

(b) Litter, waste, and refuse (e.g. garbage, offal, and damaged containers) within the immediate vicinity of the plant, buildings, or structures;

• • • • •

5. Section 260.99(g) is amended to read as set forth below:

§ 260.99 Buildings and structures.

• • • • •

(g) Every practical precaution shall be taken to exclude dogs, cats, and vermin (including, but not being limited to, rodents and insects) from the rooms from which processed products are being prepared or handled and from any rooms from which ingredients (including, but not being limited to salt, sugar, spices, flour, and fishery products) are handled or stored. Screens, or other devices, adequate to prevent the passage of insects shall, where practical, be provided for all outside doors and openings. The use of poisonous cleaning agents, insecticides, bactericides, or rodent poisons shall not be permitted except under such precautions and restrictions as will prevent any possibility of their contamination of the processed product.

In Part 266—United States Standards For Grades of Frozen Raw Breaded Fish Portions:

Section 266.1 is amended to read as follows:

§ 266.1 Description of the product.

Frozen raw breaded portions are clean, wholesome, uniformly shaped, unglazed masses of cohering pieces (not ground) of fish flesh coated with breading. The portions are cut from frozen fish blocks; are coated with a suitable, wholesome batter and breading; and are packaged and frozen in accordance with good commercial practice. They are maintained at temperatures necessary for the preservation of the product. Frozen raw breaded fish portions weigh more than 1½ ounces, and are at least ⅜-inch thick. Frozen raw breaded fish portions contain not less than 75 percent, by weight, of fish flesh. All portions in an individual package are prepared from the flesh of one species of fish.

These regulations shall become effective upon publication in the FEDERAL REGISTER.

(Sec. 6, 70 Stat. 1122; 16 U.S.C. 742e; secs. 203, 205, 60 Stat. 1087, 1090, as amended; 7 U.S.C. 1622, 1624)

JOHN A. CARVER, JR.,
Under Secretary of the Interior.

MAY 26, 1965.

* * * * *

AMENDED REGULATIONS UNDER THE COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT:

Amendments to Title 50, Code of Federal Regulations, Part 253--Commercial Fisheries Research and Development--were published in the Federal Register, June 11, 1965, at which time they became effective. The amendments apply only to Sections 253.2(a) and 253.3(f) of the regulations.

The original regulations in 50 CFR Part 253 brought into effect the Commercial Fisheries Research and Development Act of 1964 (P. L. 88-309). That Act provided, among other things, for the payment under Section 4(a) of $5 million annually to States for commercial fishery research and development over a 5-year period. Congress adjourned in 1964 before it was able to appropriate funds to implement that portion of the Act.

States are required to provide matching funds equal to at least 25 percent of the cost of a project financed under Section 4(a) of P. L. 88-309. Generally the matching funds provided by States must be additional funds allocated for the particular project and not funds diverted from some other commercial fishery project. But a limited exception to that requirement was provided in Section 253.2(a) of the regulations, for the benefit of those States in which the legislature did not meet after the Act was approved. In such case, the taking of State matching funds from appropriations for other fishery projects could be considered in fiscal years 1965 and 1966. The purpose of the amendment to Section 253.2(a) is to extend that exception for a limited time after Federal funds are appropriated to implement the Act.

The amendment to Section 253.3(f) of the regulations provides an exception to State contracting procedures in respect to contracts for research and development and professional services.

Following are the amendments as published in the Federal Register, June 11, 1965:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER F—AID TO FISHERIES

PART 253—COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT

Interpretation of the Authorization; Use of Research and Development Funds

On page 5382 of the FEDERAL REGISTER of April 15, 1965, there was published a notice and text of proposed amendments to §§ 253.2(a) and 253.3(f) of Part 253 of Title 50, Code of Federal Regulations. The purpose in amending § 253.2(a) was to extend the time during which a State can utilize funds which have previously been provided for other commercial fishery projects. The purpose of amending § 253.3(f) was to provide an exception to State contracting procedures in respect to contracts for research and development and professional services.

Interested persons were given 30 days in which to submit written comments, suggestions, or objections with respect to the proposed amendments.

One comment was received pertaining to the amendment of § 253.2(a). Consideration has been given to this comment and appropriate clarifying changes have been made in this section. These changes will permit a State to utilize funds during fiscal years 1965 and 1966 which have previously been provided for other commercial fisheries research and development because a State legislature did not meet for a significant and practicable period of time after appropriation of funds for section 4(a) of the Act. No comments were received on the proposed amendment to § 253.3(f).

§ 253.2 Interpretation of the authorization.

* * * * *

(a) Supplement, and, to the extent practicable, increase the amounts of State funds. The words "supplement, and, to the extent practicable, increase the amounts of State funds" mean that State funds, to be used for at least 25 percent of the cost of a project financed with research and development funds, will be additional funds provided for that project and will not represent funds diverted from some other commercial fishery project; except, that during fiscal years 1965 and 1966, the fact that a State legislature did not meet for a significant and practicable period of time after appropriation of funds for section 4(a) of the Act will be considered evidence that it is not feasible for the State Agency to furnish funds that have not been previ-

ously used for other commercial fishery projects.

* * * * *

§ 253.3 Use of research and development funds.

* * * * *

(f) *Contracts.* Supply, service, equipment, and construction contracts, other than research and development contracts and contracts for professional services, involving an expenditure of $2,500 or more entered into by a State Agency for the execution of approved project activities shall be based upon free and open competitive bids. If a contract is awarded to other than the lowest responsible bidder, the payment of the Federal portion of the cost of the project shall be based on the lowest responsible bid, unless it is satisfactorily shown that it was advantageous to the project to accept a higher bid. Upon request, the State Agency shall certify and promptly furnish to the Secretary a copy of each contract executed and copies of all bids received concerning the contract. Contracts for research and development, and professional services may be negotiated, provided that the Secretary is satisfied that adequate steps are taken to insure economical and efficient services and the impartial selection of contractors.

* * * * *

This amendment shall become effective on the date of publication in the FEDERAL REGISTER.

JOHN A. CARVER, JR.,
Acting Secretary of the Interior.

JUNE 8, 1965.

Note: See Commercial Fisheries Review, June 1965 p. 83.

* * * * *

VESSEL DEFINITION AMENDMENT UNDER FISHING VESSEL MORTGAGE INSURANCE PROCEDURES:

An amendment to Title 50, Code of Federal Regulations, Part 255 (Fishing Vessel Mortgage Insurance Procedures), was published in the Federal Register, July 1, 1965. The amendment revises paragraph (a) of Sec. 255.2 to read:

> (a) Fishing vessel. The term "fishing vessel" includes any vessel documented or to be documented as a fishing vessel of the United States which is designed to be used in catching fish, processing or transporting fish loaded on the high seas, or any vessel outfitted for such activity.

The purpose of the revision is to change the definition of fishing vessel in the mortgage insurance regulations to conform with the definition provided for in the United States Fishing Fleet Improvement Act.

Note: See Commercial Fisheries Review, July 1965 p. 101.

Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: Introduced in House, H. R. 9195 (Fogarty) June 17, 1965, H. R. 9331 (Duncan of Tenn.) June 22, and H. R. 9485 (Rhodes of Pa.) June 28, to amend the Antidumping Act, 1921; to Committee on Ways and Means.

Rep. Thompson of Texas in Congressional Record, June 23, 1965 (pp. 14003-14004), pointed out that passage of the proposed 1965 amendment to the Antidumping Act of 1921--S. 2045, H. R. 8510, and related bills--would enable our country to lead the way in the difficult and delicate task of formulating effective curbs on dumping. These could later be proposed to other nations in due course as a practical model. Same day Sen. Scott inserted (p. 14042) an article from the Chicago Tribune, June 14, 1965, "Antidumping Bill Gets Solid Support," by Eliot Janeway, consulting economist, Chicago Tribune press service.

AQUATIC PLANT CONTROL: H. R. 8990 (Morton) introduced in House, June 10, 1965, to provide for the control and progressive eradication of certain aquatic plants in the States of Maryland, Virginia, New Jersey, and Tennessee; to Committee on Public Works.

CALIFORNIA COMMERCIAL FISHING INDUSTRY: Senate received a joint resolution of the Legislature of the State of California (S. J. Res. 46), pointing out the importance of the California fishing industry, and urging the enactment of legislation in the Congress of the United States designed to assist the American Commercial fishing industry through fisheries loans and through expanded marine research.

FISH AND WILDLIFE COORDINATION ACT: H. R. 9492 (Dingell) introduced in House June 28, 1965, to amend the Fish and Wildlife Coordination Act to provide adequate notice and opportunity for the Secretary of the Interior and State fish and wildlife agencies to conduct studies on the effects of projects licensed by Federal agencies on fish and wildlife resources, and for other purposes; to Committee on Merchant Marine and Fisheries.

FISHERIES LOAN FUND EXTENSION: Committee on Commerce reported (S. Rept. 325) favorably to Senate June 14, 1965, S. 998.

S. Rept. 325, Fisheries Loan Act (June 14, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 998), 10

pp., printed. Discusses purpose of the bill, status of fishery loan fund, costs, and presents agency reports.

Senate June 16, 1965, passed with committee amendment S. 998, with title amended: "to amend section 4 of the Fish and Wildlife Act of 1956 to authorize the Secretary of the Interior to make loans for the financing and refinancing of new and used fishing vessels, and to extend the term during which the Secretary can make fisheries loans under the Act." Sen. Mansfield inserted in that day's Congressional Record (pp. 13372-13373) an excerpt from the report (S. Rept. No. 325). Purpose of the bill, as amended, is to extend for an additional 5 years the fishery loan program administered by the Bureau of Commercial Fisheries. The loan program was initiated under section 4 of the Fish and Wildlife Act of 1956 and expires June 30, 1965. Would modestly expand the scope of the present program to permit a loan to be made regardless of whether the vessel to be acquired will replace an existing vessel. Would also remove the present minimum annual interest rate of 3 percent and substitute a formula for establishing the interest rate. The formula provides for the annual payment to the Treasury from the loan fund of interest on the cumulative amount of appropriations available as capital to the fund taking into consideration the average cost of all outstanding interest-bearing Treasury obligations of comparable maturity. At the present time, this would result in a 4-percent interest rate. Although a minimum of 3 percent is permitted under the present law, the practice generally has been to charge 5 percent and it is anticipated that this practice would continue under the proposed amendment. The committee amendments added certain specific conditions to the making of loans. The conditions, which are similar to those now in Department regulations, relate to the requirement of adequate security, requirements regarding the applicant's ability and experience to operate a fishing vessel, and the applicant's citizenship. In addition, the Secretary is required to determine that a loan on a vessel, which will not replace an existing vessel, will cause no economic hardship to efficient vessel operators already operating in that fishery. The final amendment provides that the money now available in the fund will remain available for use from and after July 1, 1965.

House June 17, 1965, received Senate-passed S. 998; to Committee on Merchant Marine and Fisheries. House Committee June 30, 1965, ordered favorably reported to the House S. 998 (in lieu of H. R. 4227). July 7, 1965, Committee reported (H. Rept. 600) to House S. 998, to amend section 4 of the Fish and Wildlife Act of 1956 to authorize the Secretary of the Interior to make loans for the financing and refinancing of new and used fishing vessels, and to extend the term during which the Secretary can make fisheries loans under the act, without amendment; to Committee of the Whole House on the State of the Union.

FISHERMEN'S COOPERATIVE ASSOCIATIONS BANK: H. R. 8922 (Hagen of Calif.) introduced in House June 9, 1965, to provide credit facilities for use of fishermen's cooperative association through establishment of a bank for Fishermen's Cooperative Associations, and for other purposes; to Committee on Merchant Marine and Fisheries. Would authorize and direct the Secretary of the Interior to charter a "Bank for Fishermen's Cooperative Associations," with principal offices in Washington, D. C. The bank would have 7 directors appointed by the Secretary, with the Director of the Bureau of Commercial Fisheries serving as Chairman of the Board of Directors. Would authorize an appropriation of $10 million as a revolving fund to be used in making loans to fishermen's cooperative associations for the following purposes: "(1) To finance fish and shellfish or products thereof stored in cold storage or other storage facilities owned, leased, or used by such fishermen's cooperative associations . . . . (2) To provide operating capital required to supplement the capital funds of fishermen's cooperative associations; (3) To finance or refinance the acquisition of land, buildings, and equipment used by fishermen's cooperative associations in connection with activities related to the processing, preparing for market, handling, or marketing of fish and shellfish; the purchasing, testing, grading, processing, distributing, or furnishing of fishing gear, fuel, ice, and other supplies . . . and the furnishing of business services to such activities; (4) To finance and refinance the operations, maintenance, replacement, repair, and equipment of fishing gear and vessels . . . ." In addition, bill contains a "Declaration of Policy," which states that fishermen's cooperative associations, as defined in the Act of June 25, 1934, "materially contribute toward the promotion of effective merchandising of fish and shellfish in interstate and foreign commerce," and further states that provisions of the bill which provide credit facilities to these associations are necessary "in order to promote the effective merchandising of fish and shellfish by aiding in preventing excessive fluctuations or depressions in prices and thus disrupting domestic markets and by maintaining the economic health of fishermen's cooperative associations."

FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING: Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met June 17, 1965, on H. R. 3955, to make clear that fishermen's organizations have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends. Same day and June 21, Subcommittee held a hearing on the bill.

FISHING LIMIT OF 12 MILES: S. 2218 (Bartlett and 2 others), S. 2225 (Magnuson) introduced in Senate and H. R. 9531 (Downing), H. R. 9540 (Meeds) introduced in House, June 29, 1965, to establish a contiguous fishery zone beyond the territorial sea of the United States; to Committee on Commerce and Committee on Merchant Marine and Fisheries, respectively. Sen. Bartlett in Congressional Record, June 29, 1965 (pp. 14506-14509), pointed out that the purpose of this bill is to create a 9-mile zone beyond the present 3-mile territorial sea for the conservation and protection of our coastal fishery resources. The fishery resources within this zone will be reserved for the exclusive use of American fishermen with one exception. That exception provides for the continuation of traditional fishing by foreign states within this new zone as may be recognized by the United States. He stated, "I am advised that only Canada has any historic fishery within this zone off the coast of the United States and that Canada has informally recognized reciprocal historic fisheries by the U. S. fishermen off Canada." He inserted a table--"Claims of nations to breadth of territorial sea (including zones for specialized purposes)"--prepared by the Secretary General of the United Nations on Feb. 8, 1960 (U. N. document A/Conf., 19/4) for the Second Geneva Conference on the Law of the Sea. He also inserted a tabulation showing numerous changes since the tabulation of the table. Sen. Magnuson and Rep. Meeds (p. 14623) also spoke on this proposal.

FISHING VESSEL REPLACEMENT RESERVE FUND: Subcommittee on Merchant Marine and Fisheries June 24, 1965, held hearings on S. 1858, to promote the replacement and expansion of nonsubsidized merchant and

fishing fleets, with testimony. Hearings recessed until July 7.

FOOD IRRADIATION PROGRAM: Joint Committee on Atomic Energy held hearings June 9-10, 1965, on the subject of preservation of food through the use of ionizing radiation. Committee took a close look at the commercial prospects of irradiated foods. The Food and Drug Administration has only cleared wheat, potatoes, and bacon. Commercial witnesses maintain that until increased clearances are made, they cannot accurately plot the acceptability without market testing. Another use of irradiation discussed was that of the control or irradiation of salmonella. This could reduce the necessity of required steam autoclaving by foreign governments of fish meal and bone meal. It was stated that this process reduces available lysine by 25 percent. Most public witnesses indicated that at this time and during this generation, labeling of irradiated foods would probably kill the entire process. Principally the reason is the attitude this generation has toward radiation, fallout, etc.

FOREIGN AID AND FISHERIES JURISDICTION: Senate June 14, 1965, passed H. R. 7750, providing for a foreign aid program for fiscal years 1966 and 1967, which has been amended by substituting the text, as amended, of S. 1837, as amended. Prior to this action, there were additional amendments to S. 1837. Senate by 59 yeas and 24 nays adopted an amendment by Sen. Kuchel, that provides: "No assistance shall be furnished under this Act to any country which (1) has extended or hereafter extends, its jurisdiction for fishing purposes over any area of the high seas beyond that recognized by the United States, and (2) hereafter imposes any penalty or sanction against any United States fishing vessel on account of its fishing activities in such area. The provisions of this subsection shall not be applicable in any case in which the extension of jurisdiction is made pursuant to international agreement to which the United States is a party. Sen. Kuchel spoke of the recent incidents in which U. S. vessels have been seized, fined, and fired upon by the Peruvian Government, to whom we provide aid. He stated that this amendment is necessary in order to demonstrate to any nation that the U. S. Government will not tolerate this treatment of any American citizen when he is utilizing in a legal fashion the high seas or the open seas. He inserted in Congressional Record, June 14, 1965 (p. 13014) the comments he made two years ago ("Freedom of the Seas: An Honorable Tradition that Must Be Preserved"); included is a table detailing the number and type of seizures, detentions, and other harassments of U. S. tuna vessels which occurred between Sept. 1951 and June 1963. This amendment was also discussed by Senators Magnuson, Gruening, Kennedy (Mass.), and other Senators; as well as Rep. Van Deerlin in the House. Senate insisted on its amendment, asked for conference with House, and appointed conferees. H. R. 7750 was introduced (Morgan) Apr. 29, 1965, to amend further the Foreign Assistance Act of 1961, as amended; to Committee of Foreign Affairs. Reported (H. Rept. 321) from Committee of Foreign Affairs May 7; passed House May 25, 1965. Senate placed on calendar May 26. Companion bill S. 1837 was reported (S. Rept. 170) from Committee on Foreign Affairs Apr. 28.

House June 17, 1965, disagreed to Senate amendments to H. R. 7750, agreed to the conference requested by Senate, and appointed conferees.

Conferees June 18, 1965, began to resolve the differences between the Senate- and House-passed versions of H. R. 7750, but did not reach final agreement.

FUR SEAL CONSERVATION AND PRIBILOF ISLANDS ADMINISTRATION: S. 2102 (Bartlett) introduced in Senate June 8, 1965, to protect and conserve the North Pacific fur seals, and to administer the Pribilof Islands for the conservation of fur seals and other wildlife, and for other purposes; to Committee on Commerce. Besides inserting a line-by-line analysis of the bill, Sen. Bartlett in Congressional Record, June 8, 1965 (pp. 12338-12339) commented that the bill has two principal titles. Title I gives legal expression to the terms of the Fur Seal Convention ratified by the Congress on Thursday, Jan. 30, 1964. The North Pacific Fur Seal Convention has been in effect since 1911. It is an agreement with Canada, Japan, Russia, and the United States participating which governs the conservation and utilization of the fur seal resources of the North Pacific. Title II, which deals with the administration of the islands, is designed to bring to the people of the Pribilof Islands the full benefits, rights, duties, and responsibilities which are theirs as citizens of Alaska and citizens of the United States. Would provide the Secretary of the Interior the authority he needs to see that the following reforms are carried out: inclusion of services performed before 1950 in the computation of civil service retirement benefits; transfer of title to lands, houses, and property from the Government to the citizens (fair compensation is provided for); abolishment of the pass now required to visit the islands; and development and strengthening of incorporated local government. Also H. R. 9602 (Rivers of Alaska) introduced in House July 1, to Committee on Merchant Marine and Fisheries.

GRAND ISLE AND VICINITY, LOUISIANA: H. Doc. 184, Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated May 8, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on an Interim Hurricane Survey of Grand Isle and Vicinity, Louisiana, Authorized by Public Law 71, 84th Congress, Approved June 15, 1955; referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, May 24, 1965, 162 pp., illus., printed. Contains favorable report from the Chief of Engineers, on an Interim Hurricane Survey of Grand Isle and Vicinity, Louisiana. Besides the report of the district engineer, it contains comments from various Federal agencies, State of Louisiana, and reports from the Chief of Engineers and Board of Engineers for Rivers and Harbors. One section of the report deals with economic development of fisheries and fur animals in the area, and contains a letter from Acting Regional Director of Bureau of Sport Fisheries and Wildlife, Atlanta, Ga.

HALIBUT COMMISSION: Senate Committee on Commerce, June 22, 1965, ordered favorably reported S. 1975, to authorize certain facilities for the International Pacific Halibut Commission. Committee June 30 reported (S. Rept. 383) with amendment S. 1975. Senate July 7 passed and cleared for the House S. 1975.

HEALTH, EDUCATION AND WELFARE APPROPRIATIONS, FY 1966: Subcommittee on Senate Committee on Appropriations concluded its hearings June 23, 1965, on H. R. 7765, fiscal 1966 appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies, after receiving testimony. H. R. 7765 was introduced April 29, 1965 (Fogarty).

INLAND GREAT LAKES AND WESTERN RIVER RULE FOR SMALL VESSELS: Subcommittee on Coast Guard, Coast and Geodetic Survey, and Navigation of House Committee on Merchant Marine and Fisheries

met June 22, 1965, on H. R. 956, to amend the inland, Great Lakes, and western rivers rules concerning sailing vessels and vessels under 65 feet in length. Similar to S. 1349.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1966: House disagreed to Senate amendments to H. R. 6767, making appropriations for the Department of the Interior and related agencies for fiscal year 1966; agreed to a conference requested by the Senate; and appointed conferees.

Conferees June 14, 1965, agreed to file conference report (H. Rept. 513) on the differences between the Senate- and House-passed versions of H. R. 6767. The report was printed in Congressional Record, June 14, 1965 (p. 12913). Includes funds for the Fish and Wildlife Service and its two Bureaus: Commercial Fisheries, and Sport Fisheries and Wildlife. Both Houses June 15 adopted the conference report, thus clearing the bill for the President's signature. Conference report as adopted included the following referring to Bureau of Commercial Fisheries funds:

Amendment No. 26: Appropriates $21,838,000 for management and investigation of resources instead of $21,218,000 as per the House and $22,268,000 as per the Senate. The increase provided over the House bill includes: $150,000 for a study of increasing mortality of Pacific Coast Oysters; $270,000 for ocean engineering program, of which $180,000 is for refinement and development of techniques for exploiting midwater species and $90,000 is for the development of efficient harvesting devices for Alaska shrimp resources; and $200,000 to initiate research to revitalize the Great Lakes fishing industry.

Amendment No. 27: Appropriates $1,980,000 for construction instead of $1,905,000 as per the House and $2,080,000 as per the Senate. The increase provided over the House bill includes $75,000 to complete construction and installation of fish screens in the Salmon River Drainage, Idaho. The reduction of $100,000 made by the House for management technique studies and program supervision and engineering under the Columbia River program was sustained.

Amendment No. 28: Reported in technical disagreement, but House concurred in the Senate amendment providing that any unobligated balance as of June 30, 1965, of the amount appropriated for the construction of fishing vessels in the Supplemental Appropriation Act, 1965, shall be transferred to and merged with the 1966 appropriation under this head. Conferees agreed that this action shall not establish a precedent for future years.

Fish and Wildlife Service Appropriations for Fiscal Year 1966: Budget Estimate, the House Allowance, the Senate Allowance, and the Conference Allowance.

Item	Approp. FY 1965	Budget Est. 1966	House Allow.	Senate Allow.	Conf. Allow.
FISH AND WILDLIFE SERVICE					
OFFICE OF THE COMMISSIONER OF FISH & WILDLIFE					
Salaries and expenses	444,000	444,000	444,000	444,000	444,000
BUREAU OF COMMERCIAL FISHERIES					
Mgt. and invest. of resources	19,107,900	21,218,000	21,218,000	22,268,000	21,838,000
Mgt. and invest. of resources (appropriation of receipts)	(2,125,000)	-	-	-	-
Mgt. and invest. of resources (spec. for. currency program)	300,000	300,000	300,000	300,000	1/ 300,000
Construction	5,913,000	1,405,000	1,905,000	2,080,000	1/ 1,980,000
Construction of fishing vessels	2,500,000	5,000,000	5,000,000	5,000,000	2/ 5,000,000
Fed. aid for commercial fisheries research and development	-	2,000,000	4,000,000	5,600,000	3/ 4,800,000
Gen. administrative expenses	704,000	674,000	674,000	674,000	674,000
Administration of Pribilof Islands (indefinite appropriation of receipts)	(2,454,000)	(2,454,000)	(2,454,000)	(2,454,000)	(2,454,000)
Limitation on administrative expenses, fisheries loan fund	(302,000)	(309,000)	(309,000)	(309,000)	(309,000)
Total, Bureau of Commercial Fisheries	28,524,900	30,597,000	33,097,000	35,922,000	34,592,000
BUREAU OF SPORT FISHERIES & WILDLIFE					
Mgt. and invest. of resources	35,330,000	34,935,000	35,324,300	36,814,300	36,134,300
Construction	9,257,800	2,992,000	5,115,500	7,943,700	7,077,200
Migratory bird conservation account	8,000,000	7,500,000	7,500,000	7,500,000	7,500,000
Gen. administrative expenses	1,443,000	1,458,000	1,458,000	1,458,000	1,458,000
Appalachian region fish and wildlife restoration projects	1,350,000	-	-	-	-
Total, Bureau of Sport Fisheries and Wildlife	55,380,800	46,885,000	49,397,800	53,716,000	52,169,500
Total, Fish and Wildlife Service	84,349,700	77,926,000	82,938,800	90,082,000	87,205,500

1/To remain available until expended.
2/To remain available until expended; in addition, any unobligated balance as of June 30, 1965, of amount appropriated for this purpose in Supplemental Appropriation Act, 1965, shall be transferred to and merged with this appropriation.
3/Not to exceed $300,000 shall be for program administration and $400,000 for provisions of section 4(b) of the Act. Balance of $4.1 million for apportionment to the states under section 5(a) of the Act shall be available until the close of the fiscal year following the year for which appropriated.

Amendment No. 29: Appropriates $4,800,000 for Federal aid for commercial fisheries, research and development, instead of $4,000,000 as per the House and $5,600,000 as per the Senate.

Amendment No. 30: Allocates $300,000 for administration of Federal aid for commercial fisheries research and development as per the Senate instead of $150,000 as per the House.

Amendment No. 31: Allocates $400,000 under section 4(b) of P. L. 88-309 as per the Senate instead of $100,000 as per the House. And of that amount $100,000 will be available to continue the special cooperative study to develop a virus-resistant oyster in the four Middle Atlantic States.

Amendment No. 32: Allocates $4,100,000 under section 5(a) of P. L. 88-309 instead of $3,750,000 as per the House and $4,900,000 as per the Senate.

Total appropriations for the Bureau of Commercial Fisheries for fiscal year 1966 are $34,592,000; for the Bureau of Sport Fisheries and Wildlife, $52,169,500; Office of the Commissioner of Fish and Wildlife, $444,000; total for Fish and Wildlife Service, $87,205,500.

Bureau of Sport Fisheries and Wildlife Amendment No. 33: Conference appropriates $36,134,300 for management and investigations of resources instead of $35,324,300 as proposed by the House and $36,814,300 as proposed by the Senate. The increase provided over the House bill includes: $20,000 additional funds for cooperative fish units consisting of $10,000 at the University of Georgia and $10,000 at North Carolina State College; $160,000 for the establishment of four cooperative fish units at $40,000 each for Virginia Polytechnic Institute, University of Hawaii, Oregon State University, and Iowa State University; $45,000 for expansion of sport fishing research in the North Central Reservoir area; $40,000 for the establishment of a fishery management project in Vermont; $195,000 consisting of $150,000 for the increased operation of the fish behavior tank at the Atlantic Marine Game Fish Research Center, Sandy Hook, N. J.

Amendment No. 34: Appropriates $7,077,200 for construction instead of $5,115,500 as proposed by the House and $7,943,700 as proposed by the Senate. The increase provided over the House bill includes: $100,000 for planning of the marine game laboratory on the western Gulf of Mexico; $50,000 for repair of existing docking facilities, Atlantic Marine Game Fish Research Center, N. J.; and funds for construction at National Fish Hatcheries.

H. Rept. 513, Department of the Interior and Related Agencies Appropriation Bill, 1966 (June 14, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 6767), 13 pp., printed. Committee recommended that the Senate recede from certain amendments and that House recede from its disagreement to other amendments of the Senate. Some of the amendments concerned funds of the two Bureaus of the Fish and Wildlife Service: Commercial Fisheries, and Sport Fisheries and Wildlife.

House June 17, 1965, presented to the President H. R. 6767.

H. R. 6767 was signed by the President June 28, 1965 (P. L. 89-52).

METRIC SYSTEM STUDY: Rep. Roosevelt in Congressional Record, June 17, 1965 (p. A3171), stated that he was delighted to have from the Department of Commerce a favorable report on H. R. 1154 and others, which would provide for an investigation to determine the practicability of adopting the metric system of weights and measures for use in the United States.

MINIMUM WAGE: H. R. 9063 (Reid of N. Y.) introduced in House June 15, 1965, to amend the Fair Labor Standards Act to provide for the increase in the minimum wage; to Committee on Education and Labor.

Subcommittee of Senate Committee on Labor and Public Welfare began hearings July 6, 1965, on S. 1986, to extend minimum wage coverage under the Fair Labor Standards Act, and other pending related bills (S. 763, 1741, 1770, 2210).

MORGAN CITY AND VICINITY, LOUISIANA: H. Doc. 167, Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated May 28, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on an Interim Hurricane Survey of Morgan City and Vicinity, Louisiana, Authorized by Public Law 71, 84th Congress, Approved June 15, 1955; referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, May 11, 1965, 140 pp., illus., printed. Contains favorable report from the Chief of Engineers, on an Interim Hurricane Survey of Morgan City and Vicinity, Louisiana. Besides the report of the district engineer, it contains comments from various Federal agencies, State of Louisiana, and reports from Chief of Engineers and Board of Engineers for Rivers and Harbors. One section of the report deals with economic development of fisheries and fur animals in the area, economic justification, and letter from Regional Director of Bureau of Commercial Fisheries, St. Petersburg Beach, Fla., and Director of the Louisiana Wild Life and Fisheries Commission, with letter of concurrence from Louisiana.

NEW BERN AND VICINITY, NORTH CAROLINA: H. Doc. 183, Letter from the Secretary of the Army, transmitting a letter from the Acting Chief of Engineers, Department of the Army, Dated Sept. 24, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on an Interim Hurricane Survey of New Bern and Vicinity, North Carolina, Authorized by Public Law 71, 84th Congress, Approved June 15, 1955; referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, May 24, 1965, 131 pp., illus., printed. Contains favorable report from the Acting Army Chief of Engineers on a hurricane survey of New Bern and vicinity, North Carolina. Besides the report of the district engineer, it contains comments from various Federal agencies, State of North Carolina, and reports from Acting Chief of Engineers and Board of Engineers for Rivers and Harbors. One section of the report deals with economic development of the fisheries in the area.

NORTH PACIFIC FISHERIES TREATY: Rep. Pelly in Congressional Record, June 8, 1965 (p. 12394), spoke about the Japanese violation of the North Pacific Fisheries Treaty early in June 1965, when one boat was apprehended by the U. S. Coast Guard. He inserted a resolution adopted by the Association of Pacific Fisheries at a meeting in Seattle on June 7, urging the State Department to submit a strong protest to Japan against its catching salmon of North American origin.

Sen. Bartlett in Congressional Record, June 9, 1965 (p. 12559), spoke about the Japanese violation of the North Pacific Fisheries Treaty early in June 1965, and inserted in the record a telegram from the Executive Director, Alaska Sportsmen's Council, advocating a nationwide boycott of all Japanese manufactured sporting goods.

OCEANOGRAPHIC AGENCY OR COUNCIL: Rep. Wilson in extension of remarks inserted in Congressional Record, June 10, 1965 (pp. A3013-A3014) an article from Undersea Technology of May 1965: "Russian Fisheries Make Money and Serve Military."

OCEANOGRAPHIC COMMISSION: Introduced in House, H. R. 9064 (Rogers of Fla.) June 15, H. R. 9483 (Reinecke) June 28, H. R. 9617 (Hanna) July 2, H. R. 9667 (Downing) July 7, 1965, to establish a National Commission of Oceanography; to Committee on Merchant Marine and Fisheries. Rep. Rogers, in Congressional Record, June 15, 1965 (pp. 13239-13240), remarked that this legislation authorizes the President to appoint a Commission which will investigate the current status of U. S. efforts in the field of oceanography and recommend a future course of action with respect to our national needs and development programs. The Commission would be composed of five people from the field of industry; five from government; and five from the universities and laboratories participating in oceanographic work. ". . . The need for this Commission can be illustrated when we see that over $44.7 million is being expended by the Federal Government in support of oceanographic research--yet this program is a splintered effort handled by the 18 departments and agencies . . . ." Rep. Hanna in Congressional Record, July 2, 1965 (p. 12986), pointed out that he had introduced a companion measure to H. R. 9064. The Commission would be authorized to conduct a "comprehensive investigation and study of all aspects of oceanography" and "recommend an overall plan for an adequate oceanographic program that will meet the present and future needs" of the United States. This investigation would include a review of the need for natural resources from the oceans and the current programs which are under way to meet those needs. The Commission would conclude by recommending an organizational plan and budget to accomplish the recommended goals, with final report to be filed 2 years after enactment of the bill.

OCEANOGRAPHIC RESEARCH VESSEL INSPECTION: Oceanographic Research Vessels Exemption: Hearings before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on H. R. 3419 and H. R. 7320, bills to exempt oceanographic research vessels from the application of certain vessel inspection laws, and for other purposes, May 4, 5, 1965, Serial No. 89-8, 74 pp., printed. Includes texts of bills, departmental reports, and statements and communications of various Federal Officials, Representatives, research centers, universities, and associations.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries met in executive session June 10, 1965, and ordered reported favorably to the full committee S. 627 (amended) (in lieu of H. R. 3419, and identical bills), to exempt oceanographic research vessels from the application of certain vessel inspection laws. Full Committee ordered bill reported favorably June 30, and reported (H. Rept. 599) it with amendments to House on July 7; referred to Committee of the Whole House on the State of the Union.

OCEANOGRAPHY: Sen. Pell in Congressional Record, June 17, 1965 (p. 13570), discusses the 4-day meeting held in Washington week of June 14 on the subject of ocean science and ocean engineering, with dual sponsorship by the Marine Technology Society and the American Society of Limnology and Oceanography. A great deal of the discussion centered on the role of the Federal Government in ocean development.

ORDERLY MARKETING ACT 1965: H. R. 8855 (Donohue) introduced in House June 8, 1965, to provide for the orderly marketing of articles imported into the United States, to establish a flexible basis for the adjustment by the U. S. economy to expanded trade, and to afford foreign supplying nations a fair share of the growth or change in the U. S. market; to Committee on Ways and Means.

PESTICIDES AND FISH AND WILDLIFE: Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met June 22, on H. R. 4157 and S. 1623, to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides. Same Committee met on H. R. 4158, to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemical designed for mass biological controls. Hearings concluded same day.

RUSSIAN FISHERIES OFF AMERICAN SHORE: Rep. Wyatt (Congressional Record, June 30, 1965 pp. 14721-14722), addressed the House on "Russian Fishery on American Shore."

SMALL BUSINESS DISASTER ASSISTANCE: House June 21, 1965, passed S. 1796, to amend the Small Business Act to provide additional assistance for disaster victims, and cleared the bill for the President's signature. Senate June 23, 1965, presented to the President S. 1796. President signed it June 30, 1965 (P. L. 89-59).

STATE DEPARTMENT APPROPRIATIONS FY 1966: H. Rept. 427, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, Fiscal Year 1966 (May 27, 1965, report from the Committee on Appropriations, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 8639), 41 pp., printed. Committee report in explanation of the accompanying bill making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for the fiscal year 1966. Included under the State Department are funds for the various International Fisheries Commissions. Bill passed House June 1.

Subcommittee of Senate Committee on Appropriations, June 8, 1965, heard the Secretary and Deputy Under Secretary of State testify on H. R. 8639, State, Justice, and Commerce appropriations for fiscal year 1966. Hearing continued. Under State Department are included funds for International Fisheries Commissions. Subcommittee July 1, 1965, concluded its hearings on H. R. 8639.

Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations for 1966: Hearings before a subcommittee of the Commit-

tee on Appropriations, House of Representatives, 89th Congress, 1st session, subcommittee on Departments of State, Justice, and Commerce, the Judiciary and Related Agencies appropriations, 1,101 pp., printed. Covered is testimony on funds for Small Business Administration, Special Representative for Trade Negotiations, and U. S. Tariff Commission.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: H. R. 9334 (Morton) introduced in House, June 22, 1965, to provide for the conveyance of certain real property of the United States to the State of Maryland; to Committee on Interior and Insular Affairs. Property affected includes site of Bureau of Commercial Fisheries Technological Laboratory, College Park, Md.

TERRITORIAL SEA AND CONTIGUOUS ZONE CONVENTION: H. R. 9530 (Downing) introduced in House June 29, 1965, to protect coastal fishery and other resources by implementing the Convention on the Territorial Sea and the Contiguous Zone; to Committee on Merchant Marine and Fisheries.

TRADE EXPANSION ACT: Introduced in House H. R. 9131 (Herlong) June 16 and H. R. 9191 (Betts) June 17, 1965, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means.

Rep. Dent in Congressional Record, June 23, 1965 (pp. 13993-13995), stated that he was in full accord with the legislation to amend the Trade Expansion Act of 1962 and was happy to join in the introduction of it. Also, he said: "I will support this legislation as a holding device, to hold onto our industrial competitiveness in our own markets . . . ."

Rep. Sikes in Congressional Record, June 30, 1965 (p. 14738-14739), pointed out that he is convinced that the Trade Expansion Act of 1962 is in need of amendment and referred to his bill, H. R. 9335, which would relax the requirements for relief in cases of industries, worker groups, or companies hurt as a result of tariff reductions or imports. Rep. Thomson in Congressional Record, July 6, 1965 (pp. 15116-15117), spoke in the House on the Trade Expansion Act of 1962 and urged amendment of the Act to provide a remedy for injury to domestic industry from imports. He stated that nearly 40 percent of our total imports come in free of duty--among examples given were shrimp, lobsters, and frozen tuna.

H. R. 9654 (Baring) introduced in House July 7, 1965, to amend the Trade Expansion Act of 1962; to Committee on Ways and Means. Rep. Baring in Congressional Record, July 7, 1965 (pp. 15185-15186) stated, "I believe that the Trade Expansion Act of 1962 was not good legislation and feel that the time has come when it needs to be changed." He pointed out that the bill he was introducing would not prevent all tariff reductions; but it would remove from the President's list products that are already imported in volume and need no further encouragement to capture more of our market. It would also make possible the limitation of imports through import quotas if imports in recent years have increased as much as 75 percent and have already risen to at least 7½ percent of domestic production.

VESSEL MEASUREMENT: S. 2142 (Magnuson) introduced in Senate June 14, 1965, to simplify the admeasurement of small vessels; to Committee on Commerce. Sen. Magnuson inserted in Congressional Record, June 14, 1965 (pp. 12962-12964), a letter and analysis from the Secretary of the Treasury requesting the proposal. Purpose of the bill is to substitute for the present intricate system of tonnage computation based on detailed physical measurement of the hull and deck structure a simplified method, at the owner's option and for pleasure vessels only, which would permit the assignment of tonnages on the basis of the products of a vessel's length, breadth and depth, and appropriate coefficients. Bill is identical with S. 2793 introduced in 88th Congress.

WATER POLLUTION CONTROL ADMINISTRATION: Rep. Kunkel in Congressional Record, June 14, 1965 (p. 12926), remarked that a Water Quality Act passed the Senate Jan. 28 and the House Apr. 28. The two versions of the legislation differ, which is not unusual. "What is unusual is that the Senate, whose turn is next, has gone this long without indicating whether it accepts the House version or whether it wants a joint conference to work out the differences."

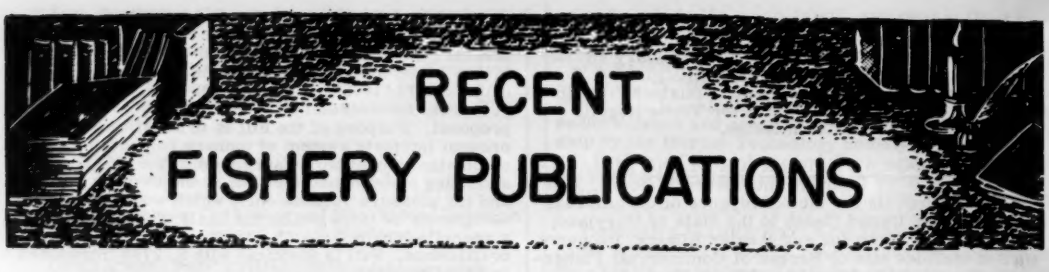
WATER PROJECT RECREATION ACT: Committee of Conference submitted to House June 22, 1965, report (H. Rept. 538) and statement on S. 1229, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects, and for other purposes.

H. Rept. 538, Uniform Policies on Multiple-Purpose Water Resource Projects (June 22, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 1229), 9 pp., printed. Committee recommended that Senate recede from its disagreement to the amendment of the House and agree to same with an amendment. The amendment amplifies the policy of the Congress and intent of the Act. Includes statement of managers on the part of the House. Act provides for uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects.

House June 23, 1965, by a voice vote adopted the conference report on S. 1229, and sent the legislation to the Senate. A statement on the part of the managers of the House was inserted in the Record, which details the agreement between the House and Senate.

Senate June 25, 1965, adopted conference report on S. 1229. Motion to reconsider this action was tabled. S. Con. Res. 40, to provide for correction in the enrollment of S. 1229 was adopted by the Senate June 25 and the House June 28.

Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS: The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.



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Number	Title
CFS-3694	Pacific Coast Fisheries, 1963 Annual Summary, 12 pp.
CFS-3767	New Jersey Landings, 1964 Annual Summary, 11 pp.
CFS-3773	New York Landings, 1964 Annual Summary, 12 pp.
CFS-3780	Frozen Fishery Products, March 1965, 8 pp.
CFS-3784	Gulf Coast Shrimp Data, 1964 Annual Summary, 55 pp.
CFS-3785	Shrimp Landings, 1964 Annual Summary, 16 pp.
CFS-3786	Rhode Island Landings, December 1964, 3 pp.
CFS-3788	Maryland Landings, February 1965, 3 pp.
CFS-3789	Fish Meal and Oil, 1964 Annual Summary, 4 pp.
CFS-3790	Maine Landings, 1964 Annual Summary, 7 pp.
CFS-3793	New Jersey Landings, February 1965, 3 pp.
CFS-3794	Rhode Island Landings, 1964 Annual Summary, 7 pp.
CFS-3796	New York Landings, February 1965, 4 pp.
CFS-3797	California Landings, February 1965, 4 pp.
CFS-3799	Virginia Landings, January 1965, 3 pp.
CFS-3801	Florida Landings, March 1965, 8 pp.
CFS-3803	Massachusetts Landings, December 1964, 9 pp.
CFS-3806	Louisiana Landings, February 1965, 3 pp.
CFS-3809	Massachusetts Landings, by Ports, 1964 Annual Summary, 15 pp.

SL-163 - Firms Producing Breaded Shrimp, 1964, 2 pp.

Sep. No. 734 - An Experiment in Electrical Fishing with an Electric Field Used as an Adjunct to an Otter-Trawl Net.

Sep. No. 735 - Equipment Note No. 16--An Exploratory Fishing and Gear Research Buoy.

FL-411 - Care of Tropical Aquarium Fishes, 4 pp., revised Jan. 1965.

FL-436 - Commercial Possibilities and Limitations in Frog Raising, 4 pp., revised 1965.

FL-443 - Construction of a Garden Fish Pool, 4 pp., revised 1965.

FL-576 - Rotenone in Fish Pond Management, 7 pp., 1965.

SSR-Fish. No. 495 - Age and Size Composition of the Menhaden Catch Along the Atlantic Coast of the United States, 1961, with a Brief Review of the Commercial Fishery, by William R. Nicholson and Joseph R. Higham, Jr., 32 pp., illus., April 1965.

Annual Report of the Bureau of Commercial Fisheries Radiobiological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1963, Circular 204, 46 pp., illus., March 1965.

The American or Eastern Oyster, by Victor L. Loosanoff, Circular 205, 38 pp., illus., March 1965. The American or Eastern oyster (Crassostrea virginica) is the oyster of commerce of the Atlantic and Gulf coasts of the United States. This report discusses the environment in which it lives; its anatomy and physiology; its growth and reproduction; enemies of the oyster; the United States oyster industry--culture and methods of harvesting; and sanitary controls used in distribution.

Progress in 1962-63, Circular 206, 31 pp., illus., Feb. 1965. During the period July 1962-Dec. 1963, the Bureau of Commercial Fisheries' Biological Laboratory at Honolulu made significant new findings in the fields of tuna behavior, the oceanography of the trade-wind zone, the ecology of the skipjack and albacore, subpopulations of skipjack and big-eyed tuna, and Pacific-wide and Hawaiian Island oceanography--studies that were outgrowths of earlier exploratory investigations. In addition, the Laboratory participated in a survey of the fishery resources of the Indian Ocean. The entire program was aided by the completion of a new vessel, the Townsend Cromwell, one of the most modern in the Nation's oceanographic fleet. This report on the Honolulu Laboratory's accomplishments during that period includes a cover photo of the Cromwell as well as photos of the Charles H. Gilbert (another Bureau vessel), tuna under study, and other research subjects.

Fishery Bulletin, vol. 63, no. 3, 1964, 227 pp., illus., printed. Contains articles on: "Life history of lake herring in Lake Superior," by William R. Dryer and Joseph Beil; "Annotated bibliography on biology of menhadens and menhadenlike fishes of the world," by John W. Reintjes; "Ocean mortality and maturity schedules of Karluk River sockeye salmon and some comparisons of marine growth and mortality rates," by R. A. Fredin; "A method of measuring mortality of pink salmon eggs and larvae," by William J. McNeil; "Movements, growth, and rate of recapture of whitefish tagged in the Apostle Islands area of Lake Superior," by William R. Dryer; "Meristic variation in the hexagrammid fishes," by J. C. Quast; "Age, growth, sex ratio, and maturity of the whitefish in central Green Bay and adjacent waters of Lake Michigan," by Donald Mraz; "Feeding and growth of juvenile soft-shell clams, Mya arenaria," by Alden P. Stickney; "Combined effects of temperature and salinity on development of eggs and growth of larvae of M. mercenaria and C. virginica," by Harry C. Davis and Anthony Calabrese; and "A critical study of Pribilof fur seal population estimates," by D. G. Chapman.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL- 5	- Denmark's Fisheries, 1964, and 1965 Trends, 11 pp.
MNL- 8	- Portugal's Fishing Industry, 1964, 28 pp.
MNL-23	- Fisheries of Chile, 1964, 22 pp.
MNL-34	- Fisheries of Greece, 1964, 7 pp.
MNL-56	- Norwegian Fisheries, 1964, 12 pp.
MNL-57	- Fisheries in the Federal Republic of Germany, 1964, 31 pp.
MNL-86	- Hong Kong's Fishing Industry, 1963-64, 21 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, April 1965, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, April 1965, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, Feb. and March 1965, 15 pp. each. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, April 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 608, 600 South St., New Orleans, 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, solubles, and oil; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, April 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, March and April 1965, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New England Fisheries--Annual Summary, 1964, by John J. O'Brien, 38 pp., illus., May 1965. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Reviews the fishery marketing trends and conditions at the principal New England ports, and highlights of the Canadian fisheries. The latest developments in the purse-seine tuna and swordfish long-line fisheries, the fish meal market, and frozen fishery products are recounted. Also includes fishery landings and ex-vessel prices for ports of Boston, Gloucester, New Bedford, Provincetown, Portland, Rockland, Point Judith, and Stonington; and principal events in the Maine sardine fishery. In addition, contains data on monthly landings and ex-vessel prices, by species, at Boston and Atlantic Ave. fish piers. The appearance of this report is enhanced by a cover photo of the New England Fish Exchange.

New York City's Wholesale Fishery Trade--Monthly Summary--March 1965, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and

analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1965, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

The American Oyster, CRASSOSTREA VIRGINICA Gmelin, by Paul S. Galtsoff, Fishery Bulletin, vol. 64, 1964, 483 pp., illus., printed, $2.75. A comprehensive biological study of Crassostrea virginica, this book opens with chapters on taxonomy, morphology and structure of the shell, the ligament, general anatomy, the mantle, labial palps, gills, and adductor muscle. Next, the transport of water by the gills, and respiration; the organs of digestion and food of the oyster; the circulatory system and blood; and the excretory and nervous systems are covered. Chapters on the organs of reproduction; eggs, sperm, fertilization, and cell cleavage; larval development and metamorphosis; and chemical composition of the oyster follow. Then the final chapter discusses in detail environmental factors affecting oyster populations--the positive factors of water movements, salinity, temperature, food, and bottom composition; and the negative factors of sedimentation, disease, competitors and predators, and pollution. This textbook was written for biologists, administrators, marine biology students, public health officers, and oyster growers. The author has succeeded in using the simplest possible language while still maintaining scientific accuracy.

"Electric rotary fish screens," by William M. Richardson, article, Progressive Fish-Culturist, vol. 27, no. 1, 1965, pp. 20-22, illus., processed, single copy 25 cents.

Progress in Sport Fishery Research, 1964, Circular 210, 119 pp., illus., processed, March 1965, 60 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AFRICA:

Articles from Tr Baltiiskogo Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr, vol. 9, 1963, printed in Russian. Baltiiskogo Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkhn. Krasnosel'skaia U1. No. 17, Moscow, U.S.S.R.

"Kharakteristika perspektivnykh rybopromyslovykh raionov u poberezh'ya Ispanskoi Sakhary i Mavritanii" (A characterization of prospective fishery regions along the coasts of the Spanish Sahara and Mauritania), by R. G. Bernikov and E. S. Prosvirov, pp. 70-80.

"Nauchno-poiskovaya ekspeditsiya na RT 'Muksun' k yugozpadnomu poberezh'yu Afriki" (The scientific and exploratory expedition of the trawler "Muksun" to the southwest coast of Africa), by Yu. A. Komarov and S. K. Kuderskii, pp. 3-19.

ALGAE:

"A list of algae from selected areas in Massachusetts," by E. E. Webber, article, Rhodora, vol. 63, no. 754, 1961, pp. 275-281, printed. New England Botanical Club, Inc., Botanical Museum, Oxford St., Cambridge, 38, Mass.

"Sarganin and chonalgin, new antibiotic substances from marine algae from Puerto Rico," by Noemi G. Martinez Nadal, V. Rodriguez Luz, and Carmen Casillas, article, Antimicrobial Agents and Chemotherapy--1963 (Proceedings of a Conference, 1963), pp. 68-72, illus., printed, 1964. American Society for Microbiology, 115 Huron View, Ann Arbor, Mich.

"Studies on the proteins, peptides and free amino acid contents in some species of marine algae from southeastern coast of India," by E. J. Lewis, article, Review Algol, vol. 7, no. 1, 1963, pp. 15-25, printed. Institute of Science, Bombay, India

ALMANAC:

The Nautical Almanac for the Year 1966, Catalog No. D 213.11:966, 311 pp., printed, 1964, $3.25. U. S. Naval Observatory, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Provides data required for the practice of astronomical navigation at sea.

AMBERGRIS:

"Ambra" (Ambergris), by M. V. Ivashin, article, Zoologicheski Zhurnal, vol. 42, no. 7, 1963, pp. 1099-1103, illus., printed in Russian with English summary. Redaktsiia Zoologicheskogo Zhurnala, Podsosenskii per. d. 21. Moscow B-64, U.S.S.R.

AQUATIC BIOLOGY:

Books on Aquatic Biology--Fresh Water and Marine, by Carl R. Keeler, 227 pp., processed, 1965. Facile Press, 2306 Mission Rd., Tallahassee, Fla. This list of nearly 2,000 titles of aquatic biology texts includes only those currently in print and published in English. It is international in scope, covers all phases of the subject from algae to mammalia, and includes many Russian works. In addition to listing the books by 55 subjects, it includes an author index and publishers' addresses. Of particular interest are the subject sections on algae, mollusca, arthropoda, pisces, reptilia, behavior, distribution, and economic aspects. This list should be of value to teachers and researchers in the natural sciences throughout the world.

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AUSTRALIA:

Annual Report of the Division of Fisheries and Oceanography, 1963-64, 81 pp., printed, 1964. Commonwealth Scientific and Industrial Research Organization, Cronulla, N. S. W., Australia.

Articles from Australian Fisheries Newsletter, vol. 24, 1965. Fisheries Branch, Department of Primary Industry, Canberra, Australia.:

"Australians eat more fish but most of it imported," by P. C. Pownall, no. 4, April, p. 23.

"Record 1963/64 fin fish catch"; "Drop in local fish most marked in New South Wales"; "Australian marine and freshwater fisheries production, 1963/64," no. 3, March, pp. 5, 23, 32, 24-26. Although Australian finfish production for the 1963/64 financial year was a record 89.7 million pounds, there was a sharp drop in landings of some popular food fish such as mullet, flathead, and whiting. This trend is shown in an analysis by the Fisheries Branch of the annual table of marine and fresh-water edible fisheries, abstracted in these articles. Tuna production jumped from 11 to 18 million pounds; scallop production rose to 15.4 million pounds (landed weight) as a result of the opening of new beds in Port Phillip Bay, Victoria. Spiny lobster landings fell by nearly 4 million pounds, but shrimp catches increased by 6 percent, chiefly as the result of production from new grounds off Western Australia. The fish and shellfish production for each state (including Tasmania) is analyzed in the final article.

BELGIUM:

Rederscentrale vzw. Jaarverslag, 1964 (Annual Report of the Rederscentrale, 1964), 46 pp., printed in Dutch. Federscentrale v.z.w., H. Baelskaai 25, Oostende, Belgium. Contains two sections since "Rederscentrale" is not only a professional organization, but also a commercial organization, which under the minimum price system purchases fish that cannot be sold at the minimum prices at public auctions.

Articles from France Pêche, no. 93, March 1965, printed in French, single copy 2.5 F (about US$0.50). France Pêche, Boîte Postale 179, Lorient, France.:

"L'aide a la pêche en Belgique" (Aid for the fisheries in Belgium), pp. 22-25, illus.

"La flotte de pêche Belge" (The Belgian fishing fleet), p. 26.

BOTULISM:

"Bolulism from canned tuna fish," by R. W. Johnston, J. Feldman, and R. Sullivan, article, Public Health Reports, vol. 78, no. 7, 1963, pp. 561-564, printed. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

CANADA:

"Canada's fisheries exports reach all-time record," by T. R. Kinsella, article, Foreign Trade, vol. 123, no. 10, May 15, 1965, pp. 2-8, illus., printed, single copy C$0.25. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Exports of Canadian fisheries products reached an all-time record of C$202.6 million in 1964, an increase of nearly 18 percent over 1963. Imports also rose during the period. This article discusses exports of Canadian fresh and frozen fish, salted and canned fish, mollusks and crustaceans, and industrial products. It also touches on fishery conferences, missions, and fairs held in 1964. The United States is one of the principal buyers of Canadian fishery products.

The Fisheries of Canada, 23 pp., printed. (Reprinted from Canada Year Book 1963-64.) Canada Year Book, Handbook and Library Division, Dominion Bureau of Statistics, Ottawa, Canada.

Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.:

Fisheries Statistics, New Brunswick, 1963, Catalogue No. 24-204, 35 pp., illus., processed in French and English, May 1965, C$0.75.

Fisheries Statistics, Ontario, 1963, Catalogue No. 24-209, 12 pp., illus., processed in French and English, April 1965, C$0.50. Contains tables giving the value of fish landed in Ontario, 1956-1963; quantity and value of landings by species and fisheries districts, 1962-63; captital equipment used in the primary fisheries operations; number of persons engaged in the fisheries; and new capital investment in the commercial fishery.

CANDLEFISH:

"Contribution to the marine life history of the eulachon, Thaleichthys pacificus," by W. E. Barraclough, article, Journal of the Fisheries Research Board of Canada, vol. 21, no. 5, 1964, pp. 1333-1337, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

CARP:

"Energeticheskii i belkovyi balans nagul'nogo karpovogo pruda" (Energy and protein balance of a carp feeding pond), by G. I. Shpet and T. V. Kozadaeva, article, Nauchnye Trudy Ukrain. Nauchno-Issledovatel'skii Institut Rybnogo Khoziaistva, vol. 15, 1963, pp. 27-43, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"Genetic improvement of carp. V--A comparison of fall and winter growth of several carp progeny," by G. Wolfarth, M. Lahman, and Rom Moav, article, Bamidgeh, vol. 16, no. 3, 1964, pp. 71-76, illus., printed. Department of Fisheries and Fish Breeders' Association Nir-David, D. N., Hakirya, Israel.

Untersuchungen uber ein Fliessbandsystemm zur Abfischung von Karpfenteichen und Karpfenintensivgewassern (Studies on a Conveyor System for Landing Carp from Ponds and from Intensively Cultivated Lakes), by G. Predel and G. Seifert, Reprint No. 1964/50, 15 pp., illus., printed in German with Russian and English summaries. (Reprinted from Zeitschrift fur Fischerie und Deren Hilfswissenschaften, vol. 12, nos. 6/7, 1964, pp. 463-477.) Institut fur Binnenfischerei, Muggelseedamm 310, Berlin-Friedrichshagen, Democratic Republic of Germany.

"Znachenie estestvennogo i iskusstvennogo korma pri vyrashchivanii karpov-segoletkov" (The effect of natural and artificial foods on the rearing of carp finger-

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lings), by V. S. Kirpichnikov, article, Rybnoe khozyaistvo vnutrennykh vodoemov Latv. SSR (Fisheries of Latvian inland waters), vol. 7, 1963, pp. 339-346, printed in Russian. Akademii Nauk Latvia SSR, Riga, U.S.S.R.

CATFISH:

"Effect of forced activity on blood lactic acid in channel catfish, Ictalurus punctatus (Rafinesque)," by Charles Wax Caillouet, Jr., article, Dissertation Abstracts, vol. 25, no. 4, 1964, pp. 2668-2669, printed. University Microfilms, Inc., University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"One new species and two redescriptions of catfishes of the South American callichthyid genus Corydoras," by Stanley H. Weitzman, article, Proceedings of the United States National Museum, vol. 116, no. 3498, 1964, pp. 115-126, illus., printed. U. S. National Museum, Washington, D. C. 20560.

CHILLING AND FREEZING:

La Conservation par le Froid des Poissons, Crustacés et Mollusques (The Cold-Preservation of Fish, Crustaceans, and Mollusks), by France Soudan, Michel Anquez, and Alain Benézit, Encyclopedie du Froid, 30 pp., illus., printed in French, 1965. J. B. Baillière et Fils, Editeurs, 19, Rue Hautefeuille, Paris 6e, France. Some of the chapters on cold-preservation of fish: anatomy and physiology; variation in composition (proteins, fats, other components) with the sexual cycle; chemical composition and decomposition; microbiology of fish; preservation by refrigeration; supplementary means of preservation--washing, evisceration, chemical preservatives; equipment for refrigeration and storage; ice-making; freezing of fish; freezing apparatus and procedures; and transport of frozen fish. Also contains chapters on: morphology, physiology, and chemical composition of crustaceans; their preservation by chilling and freezing; and mollusks and their chemical composition, bacteriology, and preservation by cold.

COD:

"Frisehastighetens innflytelse pa kvaliteten" (The influence of rate of freezing on cod quality), by G. Lorentzen and K. Traa, article, Kjoleteknikk og Fryserinaering, vol. 16, no. 2, Mar.-Apr. 1964, pp. 1-4, printed. Institutt for Kjoleteknikk, Trondheim, Norway.

"Materialy po pitaniyu saiki" (Data on the nutrition of arctic cod Boreogadus), by A. V. Belova and M. I. Tarverdieva, article, Tr Murmanskogo Morskogo Biol Inst, vol. 5, no. 9, 1964, pp. 143-147, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"The refractive index of the muscle of fish and shellfish. I--A possible method for measuring protein deterioration in fresh and frozen cod," by M. K. Elerian, article, Journal of the Science of Food and Agriculture, vol. 16, no. 4, April 1965, pp. 228-232, illus., printed, single copy £1 17s. 6d. (about US$5.25). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Articles from Soviet Fisheries Investigations in the Northwest Atlantic (Translation), printed, 1964. Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

"Biological peculiarities of cod with different otolith structure in the Northwest Atlantic," by E. M. Mankevich, pp. 324-337, illus.

"Biology of the Labrador and Newfoundland cod," by A. I. Postolakii, pp. 338-348, illus.

"Feeding of cod in western Greenland waters," by I. N. Sidorenko, pp. 249-255, illus.

"Size-age composition and spawning of the cod on the southwestern slope of the Flemish Cap Bank," by E. M. Mankevich and V. S. Prokhorov, pp. 349-354, illus.

"Some data on the feeding of cod in the Newfoundland area of the Northwest Atlantic," by O. A. Popova, pp. 228-248, illus.

COD AND HADDOCK:

"Nekotorye dannye o zhirnosti treski i pikshi Barentseva morya" (Some data on the fat content of Barents Sea cod and haddock), by N. S. Novikova, article, Tr Polyarnogo Nauch-Issled Proektn Inst Morskogo Rybn Khoz Okeanogr, vol. 15, 1963, pp. 149-162, printed in Russian. Poliarnii Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Khoziaistva i Okeanografii im. N. M. Knipovicha, Moscow, U.S.S.R.

CONTAINERS:

"El envase de aluminio laqueado para conservas de pescado" (continuará) (The aluminum lacquered can for preserved fish--to be continued), by M. Martinez Esteban, article, Informacion Conservera, vol. 13, no. 133, Jan. 1965, pp. 13-16, illus., printed in Spanish, single copy 30 ptas. (about US$0.50). Informacion Conservera, Colon, 62, Valencia, Spain.

CRABS:

"K voprosu ob akklimatizatsii kamchatskogo i sinego krabov v Barentsevom more," (Introduction of the king crab, Paralithodes, and the blue crab into the Barents Sea), by Yu. I. Orlov, article, Materialy Rybkhozyaistvennykh Issledovaniyakh Severnogo Basseina (Information on Fisheries Research in the Northern Basin), Part 1, pp. 46-47, printed in Russian, 1963. Gosudarstvennyi Komitet po Rybnomu Khoziaistvu pri SNKH SSSR; Poliarnii Nauchno-Issledovatel'skii i Proiektnyi Institut Morskogo Khoziaistva i Okeanografii im. N. M. Knopovicha (PINRO), Murmansk, U.S.S.R.

DENMARK:

Articles from Dansk Fiskeritidende, vol. 83, no. 16, April 16, 1965, printed in Danish. Dansk Fiskeritidende, Studiestraede 3, 2, Copenhagen K, Denmark.:

"Fisk for ekstra 800,000 kroner tilført Vesterø havn i 1964" (An extra 800,000 kroner worth of fish received at Vesterø port in 1964), pp. 217-219.

"77 millioner kg. fisk er blevet landet i de danske havne i Februar" (77 million kg. of fish were landed at Danish ports in February), pp. 207-208.

DOLLY VARDEN TROUT:

Some Feeding Habits of the Anadromous Dolly Varden SALVELINUS MALMA (Walbaum) in Southeastern

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Alaska, by Robert H. Armstrong, Informational Leaflet 51, 27 pp., illus., processed, April 8, 1965. Department of Fish and Game, Subport Bldg., Juneau, Alaska 99801.

DRYING:
Dehydrated Food Products, B. P. 940,309,20.12.61. U. S., 28.12.60, printed. Patent Office, U. S. Department of Commerce, Washington, D. C. 20231. Dehydration of moist food material, including fish and shellfish, is effected in the method described to give a product which is readily rehydrated to substantially the original form. Process consists of enveloping particles of the food in a fluid medium under partial vacuum so that moisture is rapidly evolved. The free oil is then separated from the dehydrated material. Apparatus used is described.

FACTORYSHIP:
"Large refrigerated fish carriers for Russia," article, Marine Engineer and Naval Architect, vol. 86, 1963, pp. 18-19, printed. Whitehall Technical Press Ltd., 9 Catherine Pl., London SW1, England.

FISH BEHAVIOR:
"O parametrakh reaktsii ryb v elektricheskikh polyakh peremennogo toka" (On reaction parameters of fishes in electric fields of alternating currents), by V. A. Shentyakov, article, Tr Inst Biol Vnutr Vod Akad Nauk SSSR, vol. 6, no. 9, 1963, pp. 224-229, printed in Russian. Institut Biologicheskoi Fiziki, Vodokhraneniia, Akademiia Nauk SSSR, Moscow, U.S.S.R.

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Development of the King Crab Fishery Off Kodiak Island, by George W. Gray, Jr., Robert S. Roys, and Robert J. Simon, Informational Leaflet 52, 16 pp., illus., processed, April 12, 1965. Department of Fish and Game, Subport Bldg., Juneau, Alaska, 99801. Discusses the history of the Alaska king crab fishery, types of fishing gear used, catch statistics, fishing intensity, average landed weight of crabs, size limits imposed, other regulations in the king crab fishery, and future of the industry. The expansion of the king crab fishery has probably been as rapid as that of any fishery in the world, conclude the authors. With proper management, the Kodiak Island area will remain a major crab producer, but expansion in the magnitude of 1959-63 seasons is improbable.

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Sovereignty of the Sea, Geographic Bulletin No. 3, 34 pp., printed, May 1965, 25 cents. Bureau of Intelligence and Research, Office of Research in Economics and Science, U. S. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This Bulletin concerns the rights which the United States and other countries have on, over, and under the surfaces of the oceans. Precise distinctions of jurisdiction on land areas have their counterparts along and off the shores of six continents and hundreds of thousands of islands. The merchant marines and fishing fleets of several scores of countries must operate within the precepts of the law of the sea. Oil derricks and other marine operations in coastal waters signal further exploitation of the sea for which a legal framework must be developed. In the matter of fisheries, agreements between or among interested sovereign participants are recognized by the United States. In recent months American delegations have participated in conferences designed to consider feasible fishing rights off coasts where there have been problems and claimed infractions of international procedure. The Bulletin contains short chapters on the single ocean concept, question of offshore jurisdiction, offshore pattern of zones, breadth of the territorial sea, double continental shelf, high seas and high flying, and international dissension over territorial waters. Appendices include articles on identifying and projecting a baseline, and boundaries in the sea. The tables show data on areas of the oceans and principal seas, coastline measurements of world's major political entities, and other information. Included are charts showing a continental shelf in profile, the baseline, the straight baseline, and median line boundaries between sovereign states with adjacent or opposite coasts.

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"Etude du besoin qualitatif d'azote chez la truie en gestation et lactation. Comparison de deux proteins: Farine de poisson et arachide" (Qualitative nitrogen requirements in pregnant and lactating sows. A comparison between two proteins: Ground nut and fish meal), by E. Salmon-Legagneur, article, Annales de Zootechnie (Paris), vol. 13, no. 1, 1964, pp. 51-61, illus., printed in French. Institut National de la Recherche Agronomique, 149 Rue de Gronelle, Paris (7e), France.

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A Unit Suitable for Holding and Displaying Live Lobsters, by James E. Stewart and H. E. Power, New Series Circular No. 21, 8 pp., illus., processed, April 26, 1965. Halifax Laboratory, Fisheries Research Board of Canada, Halifax, N. S., Canada. Discusses a unit which has been built and tested in Canada, suitable for holding and displaying live lobsters in dining areas, stores, and other commercial establishments. It consists of a tank, its supporting structure, a controlled refrigeration system, a pumping and filtering system, and a small air pump to aerate the water. Some suggestions on maintenance, temperature, protection of lobsters from injury and toxicity are given, in addition to a full description and diagrams of the unit. A map showing lobster fishing seasons in eastern Canada is included.

MACKEREL:

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Available from Woods Hole Oceanographic Institution, Woods Hole, Mass. 02543.:

Bibliography of Reports, 1964, compiled by Jeanne M. Backus, Ref. 64-54, 13 pp., printed, Jan. 1965. A chronological index of oceanographic research carried out by the Institution. An author index is also included.

Oceanography from Space, edited by Gifford C. Ewing, Ref. No. 65-10, 490 pp., illus., processed, April 1965, limited number of copies, $5. Proceedings of the Conference on the Feasibility of Conducting Oceanographic Explorations from Aircraft, Manned Orbital, and Lunar Laboratories, held at Woods Hole, Mass., Aug. 24-28, 1964. During the past 14 years, reconnaissance of the ocean surface by air-borne remote sensors has undergone rapid expansion until it is now widely used in marine meteorology, physical oceanography, and marine biology. The use of extended strip photography and air-borne infrared radiometry

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to map large scale features such as the Gulf Stream are two research areas in which the Woods Hole Oceanographic Institution made early contributions. This report contains an introductory briefing, and chapters on currents and the shape of the Geoid; identification of water masses; sea ice; coastal geography, geology, and engineering; and security classification of information. A chapter on marine biology contains sections on marine biology and remote sensing; oceanographic observations from manned satellites for fishery research and commercial fishery applications; possible contributions of manned (and unmanned) satellites toward advancing the fields of marine biology and biological oceanography; transparency, bioluminescence, and plankton; and detection of marine organisms by an infrared mapper.

OCEAN PERCH:

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"Biology of the West Greenland Sebastes marinus," by G. P. Zakharov, pp. 310-323, illus.

"On the groups of rosefish (Sebastes mentella Travin) in the Labrador-Newfoundland area," by K. P. Yanulov, pp. 277-289, illus.

"Parasites as indicators of local rosefish (Sebastes) stocks," by K. P. Yanulov, pp. 266-276, illus.

"Some notes on rosefish feeding in the Newfoundland area," by M. L. Kashintsev, pp. 256-265, illus.

OYSTER FARMING:

"Ouvindo 'alguem' no meio ostreicola" (Listening to an authority on oyster culture), article, Jornal do Pescador, vol. 27, no. 315, April 1965, pp. 19-21, illus., printed in Portuguese, single copy 5 Escudos (about US$0.20). Junta Central das Casas dos Pescadores, Rua de S. Bento, 644-2°, Lisbon, Portugal.

PAKISTAN:

Articles from Pakistan Journal of Science, vol. 15, no. 6, 1963. Pakistan Association for the Advancement of Science, Lahore, Pakistan:

"Marine fisheries of Pakistan. II--Problems of the fishing industry," by N. Alam Khundker, pp. 257-261.

"Methods to increase the crop harvested from the sea," by P. Korringa, pp. 271-277.

PERU:

Diagnóstico Económico Social de la Pesqueria (Estudio Preliminar) (Socio-Economic Analysis of the Fisheries--Preliminary Study), by Iavier Iparraguirre Cortez, José E. Garcia Cabrejos, and Alfonso Elejalde Zea, Documento de Trabajo, 170 pp., illus., processed in Spanish, June 1963. Oficina Sectorial de Planificacion Pesquera, Ministerio de Agricultura, Piso 18, Edif. Min. Edc., Lima, Peru. This is an extensive review of Peru's fishery industries. The latest statistics shown are for 1962. Discusses the development of the fisheries; their importance to Peru; the sea, currents (including "del Nino"), and other oceanographic data. A chapter on the fishery describes the various fishery ports and presents statistics. Other chapters present data on distribution and use of fishery products for human consumption and industrial purposes, processing plants, the role of the Government, the role of fisheries in the country's economy, and recommendations for improvement.

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"DDT persistence and its effect on aquatic insects and fish after an aerial application," by E. B. Welch and J. C. Spindler, article, Journal of Water Pollution Control Federation, vol. 36, no. 10, 1964, pp. 1285-1292, printed. Water Pollution Control Federation, 4435 Wisconsin Ave. NW., Washington, D. C. 20016.

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Yadovitye i Opasnye Ryby (Poisonous and Dangerous Fish), by E. Prosvirov, 80 pp., illus., printed in Russian, 1963, 62 Kop. (about US$0.70). Knigoizdat, Kaliningrad, U.S.S.R.

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"Eksperimental'no-ekologicheskii analiz molodi gibridov baltiiskikh losoya (Salmo salar L.) i kumzhi (Salmo trutta trutta L.), vyrashchennykh v prudakh" (Experimental and ecological analysis of pond-raised young hybrids of Baltic salmon, Salmo salar L., and

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sea trout, Salmo trutta trutta L.), by N. V. Evropeitseva, and G. V. Belyaeva, article, Referativnii Zhurnal-Biologiia, 1964, Abstract No. 10158, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

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SAURY:

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SCORPIONFISH:

Western Atlantic Scorpionfishes of the Genus SCORPAENA, Including Four New Species, by William N. Eschmeyer, Contribution No. 587, 81 pp., illus., printed. (Reprinted from Bulletin of Marine Science, vol. 15, no. 1, March 1965, pp. 84-164.) The Marine Laboratory, Institute of Marine Science, University of Miami, Fla. 33149.

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"Gulf prawn survey," by Jean V. Leyendekkers, article, Australian Fisheries Newsletter, vol. 24, no. 3, March 1965, pp. 15, 17, printed. Fisheries Branch, Department of Primary Industry, Canberra, A.C.T., Australia. The Australian trawler Rama, engaged on a 2-year survey of the shrimp fishing potential of the Gulf of Carpentaria in the far north of the Continent for the Commonwealth and Queensland Governments. A total of 1,597 experimental trawls were made over 91 cruises, ranging from 1 to 7 days' duration. By the end of 1964, 22 species of shrimp were taken; among those 7 may offer some prospect for commercial development. This article traces the progress of the survey and details some of the results so far achieved.

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Statsionara-Ural'skii Filial Akademiia Nauk SSSR, vol. 3, 1963, pp. 8-11, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

SOLE:

"Zheltoperaya kambala vostochnoi chasti Beringova morya (Kratkaya biologicheskaya kharakteristika)" (Yellowfin sole, Limanda aspera of the Bering Sea. A short biological characterization), by N. S. Fadeev, article, Tr Vses Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr, vol. 48, 1963, pp. 281-291, printed in Russian. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkhn. Krasnosel'skaia U1., No. 17, Moscow, U.S.S.R.

SOUTH AFRICA REPUBLIC:

"Anchovy project added another shoal fish to South African catch," article, The South African Shipping News and Fishing Industry Review, vol. 20, no. 4, April 1965, pp. 91, 93, 95, 97, illus., printed, single copy 30c (about US$0.45). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. The continuing expansion of the South African fishing industry has brought an increasing need for parallel services, according to the annual report of the Fisheries Development Corporation of South Africa, Ltd. covering the financial year ended Sept. 30, 1964. The Corporation, states this article, has kept pace by extending its activities to embrace the field of financial assistance, the construction and maintenance of fishing harbors, and research into new fish resources and the application of modern fishing methods. A highlight of the year's activities was the research on landings and processing anchovies, a resource not previously exploited in South African waters. While pilchard catches in South Africa declined, they remained abundant in South-West Africa.

Department of Nature Conservation, Report No. 20, 1963, 131 pp., illus., printed. Department of Nature Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, Republic of South Africa. A section on work of the Division of Inland Fisheries contains accounts of: "Jonkershoek Fish Hatchery"; "Pirie Trout Hatchery"; "Stocking of public waters"; "A description of two small scale trials concerning carp growth," by D. J. van Schoor; "A report of a tour of freshwater fish hatcheries in Europe and the Middle East," by J. J. R. Louw; "A successful experiment in the control of algae by the use of freshwater fish in industry," by J. J. R. Louw; and other projects.

"The role of the South African fishing industry in feeding the nation," by G. M. Dreosti, article, South African Medical Journal, vol. 38, no. 29, 1964, pp. 631-640, printed. Medical Association of South Africa, Box 643, Cape Town, Republic of South Africa.

SOUTHWEST PACIFIC:

Studies in Microbial Ecology of the Australasian Region, by E. J. Ferguson Wood, Contribution No. 514, 204 pp., illus., printed, 1964. (Reprinted from Nova Hedwigia, vol. 8, 1964, pp. 5-54, 453-568, 39 tables.) Marine Laboratory, Institute of Marine Science, University of Miami, Miami 49, Fla. A study of the salinity-temperature relationships of a large number of species of diatoms and dinoflagellates and of their geographical distribution has shown that a number of populations can be discerned.

SPAIN:

"1964--noventa y dos unidades aumento la flota pesquera española" (1964--92 units were added to the Spanish fishing fleet), article, Industrias Pesqueras, vol. 39, no. 908, Feb. 15, 1965, pp. 78-79, printed in Spanish, single copy 40 ptas. (about US$0.70). Industrias Pesqueras, Apartado 35, Vigo, Spain.

SPINY LOBSTER:

"The West's crayfishery and its future," by B. K. Bowen and R. G. Chittleborough, article, Australian Fisheries Newsletter, vol. 24, no. 3, March 1965, pp. 11, 13, 32, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, A.C.T., Australia. In the past 20 years the Western Australian spiny lobster catch has expanded spectacularly--from 600,000 pounds landed in 1944/45 to 21.5 million pounds in 1962/63. However, landings dropped to 18 million pounds in the 1963/64 season. Intense fishing has reduced the spiny lobster population to a point where the industry is now dependent each year on the recruitment into the commercial stock during the preceding closed season, according to the author. But if an adequate breeding stock is maintained and undersized individuals are protected, there is little reason why the population should not yield a relatively stable production in future years, he concludes.

SPRAT:

"Osezonnykh izmeneniyakh povedeniya kaspiiskoi kil'ki v zone elektricheskogo osveshcheniya" (Seasonal variations in the behavior of (Clupeonella) Caspian sprats in areas illuminated by electric light), by B. I. Prikhod'ko, article, Trudy Kaspiiskogo Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, vol. 17, 1962, pp. 58-64, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

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"Osetrovye yuzhnykh morei Sovetskogo Soyuza (Biologia, promysel, vosproizvodstvo)" (Sturgeons of the southern seas of the U.S.S.R.), article, Tr Vses Nauch-Issled Inst Morsk Rybn Khoz Okeanogr, vol. 52, 1964, pp. 1-411, illus., printed in Russian. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkhn. Krasnosel'skaia U1, No. 17, Moscow, U.S.S.R. One of the chapters is: "Biologiya osetrovykh; ikh razvedenie i promysel. Ukazatel' literatury" (The natural history of sturgeons; their cultivation and fishery. A bibliography), by G. A. Potapova, pp. 348-402.

"Rezul'taty akklimatizatsii aral'skogo shchipa (Acipenser nudiventris Lov.) v ozere Balkhash" (Results of the acclimatization of the Aral spiny sturgeon in Lake Balkhash), by N. V. Pechnikova, article, Voprosy Ikhtiologii, vol. 4, no. 1, 1964, pp. 142-152, printed in Russian. Akademiia Nauk SSSR, Ikhtiologicheskaia Komissaia, Moscow, U.S.S.R.

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Dec. 18, 1964. The Faculty of Fisheries, Kasetsart University, Bangkok, Thailand. This is a new serial publication, initiated with the establishment of the Kasetsart University Museum of Fisheries in Bangkok.

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Tide Tables--High and Low Water Predictions 1966--West Coast North and South America including The Hawaiian Islands, 224 pp., printed, 1965, $2. Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C. 20230.

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TRADE LISTS:

The U. S. Department of Commerce has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of International Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce field offices at $1.00 each:

Canneries and Frozen Foods Producers and Exporters--Chile, 6 pp., May 1965. Lists the names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm. Also contains trade and industry data on production and exports of fish and shellfish.

Canneries and Frozen Foods Producers and Exporters--Pakistan, 15 pp., April 1965. Lists the names and addresses, size of firms, and types of products (including fish and shrimp) handled by each firm. Also contains trade and industry data on production and exports of shrimp and fish.

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"The changing pattern of trawlers," article, Shipbuilding and Shipping Record, vol. 102, no. 18, 1963, pp. 579-581, illus., printed. Shipbuilding and Shipping Record, 33 Tothill St., Westminster, London SW1, England.

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"Relationship between engine power of a trawler and size of otter board," by T. Koyama, article, Bulletin, Tokai Regional Fisheries Research Laboratory, no. 33, 1962, pp. 29-32, printed in Japanese. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

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"Study on the high-speed net on two-boat trawler equipped with controllable pitch propeller," by C. Hamuro, article, Technical Report of Fishing Boat, No. 17, 1963, pp. 35-54, illus., printed in Japanese with English abstract. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

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"Instruments used for determination of parameters of trawl gear," by V. K. Savrasov, G. A. Traubenberg, and E. I. Zaitsev, article, Rybnoe Khoziaistvo, no. 1, 1963, pp. 37-47, illus., printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow, B-140, U.S.S.R.

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Universal One-Boat Midwater and Bottom Trawl, by S. Okonski, paper presented at the Second World Fishing Gear Congress, London, 25-31 May 1963, 15 pp., illus., processed in English with French and Spanish abstracts. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

TROUT:

"Storage life of vacuum-packed iced trout. I--Influence of packing material," by Poul Hansen and B. V. Jorgensen, article, Journal of the Science of Food and Agriculture, vol. 16, no. 3, March 1965, pp. 150-152, illus., printed, single copy £1 17s. 6d. (about US$5.30). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England. Reports on research conducted with gutted rainbow trout packed in two types of bag. Results showed that the storage life of gutted trout vacuum-packed individually in polyamide or polyethylene bags and kept in wet ice exceeded 2 weeks. The fish packed in polyethylene showed signs of slight fat oxidation at the end of the second week, while that in polyamide showed no fat oxidation throughout the experimental storage period of 3 weeks. Trout in both types of package suffered microbial spoilage during the third week. Viable aerobic microbial counts throughout the storage period were higher in polyethylene- than in polyamide-packed trout.

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"Assessment of the quality of canned northern bluefin tuna Kishinoella tonggol. I," by A. R. Prater and W. A. Montgomery, article, Journal of the Science of Food and Agriculture, vol. 15, 1964, pp. 885-889, printed, single copy £1 17s. 6d. (about US$5.25). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

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TURTLES:

"Stirbt die suppenschildkroete aus?" (Has the soup turtle (Chelonia mydas) become extinct?), by Tom Harrisson, article, Umschau, vol. 64, no. 11, 1964, pp. 340-343, illus., printed in German. Umschau-Verlag, Frankfurt-am-Main, Federal Republic of Germany.

UNITED STATES GOVERNMENT:

United States Government Organization Manual, 1965-66, Catalog No. GS4.109:965, illus., printed, revised June 1, 1965, $1.75. Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The official organi ation handbook of the Federal Government. Describes the creation and authority, organization, and functions of the agencies in the legislative, judicial, and executive branches of the Government. Provides supplemental information on quasi-official agencies and selected international organizations. Includes about 40 charts showing the organization of the Government, Senate, House of Representatives, departments, and independent agencies. Provides information on executive agencies and functions of the Federal Government abolished, transferred, or terminated after March 4, 1933. Lists several hundred publications, showing the types of materials available from Government establishments. Contains the Constitution of the United States, its signers, and amendments to date. Also includes descriptions of agencies working in fisheries and related fields: Interagency Committee on Oceanography, U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife.

U. S. S. R.:

"Akklimatizatsiya tikhookeanskikh lososei v basseine Barentseva i Belogo morei. Materialy po biologii treski i morskikh mlekopitayushchikh Severa" (Acclimatization of Pacific Ocean salmon in the basins of the Barents and White Seas. Data on the biology of cod and of marine mammals of the North), article, Trudy Polyarnogo Nauchno-Issledovatel'skii i Proektnogo Institut Morskogo Rybnogo Khoziaistva i Okeanografii, vol. 15, 1963, pp. 1-279, illus., printed in Russian. Poliarnii Nauchno-Issledovatel'skii i Proiktnyi Institut Morskogo Khoziaistva i Okeanografii im. N. M. Knipovicha, Moscow, U.S.S.R.

"Berech' vodoemy, okhranyat' rybnye bogatstva" (Let us protect our waters and conserve our fish resources), by T. P. Zhilenko, article, Okhrana Prirody na Dal'nem Vostoke (Conservation of nature in the Far East), pp. 107-111, printed in Russian, 1963. Okhrana Prirody na Dal'nem Vostoke, Vladivostok, U.S.S.R.

"New canned product of Caspian sprat and herring," by V. C. Ten'kovskaya, article, Rybnoe Khoziaistvo, vol. 39, no. 7, 1963, pp. 72-73, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow, B-140, U.S.S.R.

"Reka Samur i ee rybokhozyaistvennoe znachenie" (The Samur River and its fishery importance), by Yu. Saidov, article, Voprosy Kompleksnogo Ispol'zovaniya i Okhrany Vodnykh Resursov AzerbSSR (Problems of the Rational Utilization and Protection of Water Resources of Azerbaijan), pp. 160-162, printed in Russian, 1963. Akademiia Nauk Azerbaidzh. SSR, Baku, Azerbaijan S.S.R.

Rybnye Zapasy Aral'skogo Morya i Puti Ikh Ratsional'nogo Ispol'zovaniya (Fish Resources of the Aral Sea and Methods of Rational Utilization), 194 pp., illus., printed in Russian, 1964, 1 Ruble 20 Kop. (about US$1.35). "Nauka," Tashkent, U.S.S.R.

"Soviet fishery investigations and fishing in the Northwest Atlantic," by V. I. Travin and L. N. Pechenik, article, Soviet Fisheries Investigations in the Northwest Atlantic (Translation), pp. 4-54, illus., printed, 1964. U. S. Department of Commerce, Clearinghouse for Federal Scientific and Technical Information, Port Royal and Braddock Rds., Springfield, Va. 22151.

"K voprosu ob istorii rybnoi promyshlennosti Kamchatki" (On the history of Kamchatka fisheries), by V. S. Gorelik, article, Tr Dal'nevost Tekhnol Inst Rybn Prom Khoz, vol. 3, 1963, pp. 5-17, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

Articles from Rybnoe Khoziaistvo Vnutrennykh Vodoemov LatvSSR (Fisheries of Latvian Inland Waters), vol. 7, 1963, printed in Russian. Akademiia Nauk Latvii SSR, Riga, Latvia:

"Ob okhrane i vosproizvodstve rybnykh zapasov v Estonskom SSR" (On the conservation and replacement of the fish resources in the Estonian SSR), by N. V. Genina, pp. 357-362.

"Pitanie i rost molodi promyslovykh ryb v ozerakh Latvii" (Food and growth of young commercial fishes in Latvian lakes), by R. Yu. Laganovskaya and Ya. Ya. Sloka, pp. 227-232.

"Sostoyanie i perspektivy razvitiya rybnogo khoziaistva na vnutrennykh vodoemakh Litovskoi SSR" (Conditions of Lithuanian inland water fisheries and prospects of their growth), by R. S. Vol'skis, pp. 363-367.

Articles from Rybnoe Khoziaistvo Vnutrennykh Vodoemov SSSR (Fisheries of the Inland Waters of the U.S.S.R.), printed in Russian, 1963. Akademiia Nauk SSSR, Moscow, U.S.S.R.:

"Biologicheskie i rybokhozyaistvennye issledovaniya v basseine Dona vyshe Tsimlyanskogo vodokhranilishcha i puti ratsionalizatsii rybnogo khozyaistva Verkhnego Dona" (Biological and fish-cultural studies in the Don Basin above the Tsimlyansk Reservoir, and measures for a rational fishery on the Upper Don), by A. V. Fedorov, pp. 181-184.

"Sostoyanie i perspektivy razvitiya ratsional'nogo rybnogo khoziaistva na vnutrennikh vodoemakh Vostochnoi Sibiri" (Condition and prospects of developing a rational fishery in the inland waters of Eastern Siberia), by A. G. Egorov, pp. 193-200.

"Sostoyanie i perspekitvy razvitiya rybnogo khozyaistva na ozerakh, rekakh i vodokhranilishchakh SSSR"

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

(The present state and prospects of the fishing industry in lakes, streams and reservoirs of the U.S.S.R.), by P. L. Pirozhnikov, pp. 4-21.

VESSELS:

"Fibreglass pilchard vessel has speed of 11.2 knots," article, The South African Shipping News and Fishing Industry Review, vol. XX, no. 2, Feb. 1965, pp. 77, 79, illus., printed, single copy 30 c. (about 45 U. S. cents). Trial runs of the Gunfi, a fiberglass pilchard vessel, indicated that the speed, stability, and maneuverability were up to expectations and excellent. According to the boatbuilder, fiberglass is the material of the future for fishing boat hulls, and "not many years will pass before the fiberglass hull will be as familiar in the shoal fishing fleets as the wooden hull is today." The vessel is 74 ft. long overall, has a beam of 21½ ft., a molded depth of 11 ft., and a draught of 7 ft. forward and 4 ft. aft. With those dimensions, she is only 70 gross tons and can carry 130 tons of fish in her hold. The vessel is fitted with a double bottom and has 2 ballast tanks in the bows. She is built to Lloyd's rules for hulls of fiberglass, and hull frames and bulkheads are all constructed of fiberglass. The deck is also of fiberglass but has a wood plank overlay to serve as a working surface. The stern and keel are of wood which has also been used for the rubbing boards and gunwales. The deckhouse, funnel, and other superstructure are of fiberglass and the masts are of steel.

Modern Fishing Vessels, by Z. Grzywaczewski and others, OTS61-11362, 303 pp., illus., printed, 1964, $3. (Translated from the Polish, Wspolczesne Statki Rybackie, Wydawnictwo Morskie, Gydnia, 1959.) This book contains detailed information on modern fishing vessels and gear, with particular emphasis given to those produced in Poland. The introduction discusses the development of fisheries, both worldwide and in Poland. Part 1, fishing vessels as means of production, has chapters on: fishing vessel classification, requirements, characteristics; trawlers and other demersal fish-catching vessels; those designed for the pelagic fisheries; factoryships and auxiliary vessels; and present and future Polish craft. Part 2, power plants of fishing vessels, covers steam power plants, internal combustion engine power plants, the problem of utilization of engine power, and rudder systems. Part 3, equipment, discusses types of gear; navigation, radio and fish-finding devices; and lifesaving appliances. The final part, industrial installations in vessels, includes chapters on processing methods; machines and processing installations on board; refrigerating plants; and mechanization of transport--conveyors, hoists, problems of transshipment.

Study on the Development of Fishing Boat Design Based on Waveless Hull Form Theory, by N. Yokoyama, Scientific Report No. 5, 132 pp., printed in Japanese, 1961. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

WEATHER CHARTS:

Heavy Weather Guide. Part I--Hurricanes, by Edwin T. Harding; Part II--Typhoons, by William J. Kotsch, 220 pp., illus., printed, 1965, $6. United States Naval Institute, Annapolis, Md. 21402. Sweeping up from tropical zones into the colder latitudes of the northern hemisphere, vast cyclonic storms each year leave in their wakes death and devastation. In the Atlantic those storms are called hurricanes; in the Pacific, typhoons. Both kinds of storms carry inconceivable amounts of energy and have greater potential for destruction than the most powerful A-bombs. The purpose of this book is to discuss the theory, origin, and habits of those storms, and to show how to evade or survive them. The book treats hurricanes and typhoons separately, even though in most ways hurricanes and typhoons are alike. The reader, whether he is a vessel skipper, weekend sailor, or shoreside dweller, can learn about those storms from this book without actually experiencing one. Part I, on hurricanes, discusses the tropics, the hurricane's formation, its characteristics, the killer side of the storms, the Hurricane Warning Service, tips on protection at sea or ashore, and the future of hurricane forecasting and control. Part II, on typhoons, covers some topical tropical words, phrases, and concepts; the formation of a typhoon; its characteristics; forces of destruction; the typhoon's life cycle and dissipation; the effect of interaction of two typhoons--Fujiwhara effect; the typhoon-warning system; tips on protection afloat and ashore; and outlook for the future. The appendixes contain some excellent writings by weather authorities on the killer storms. This is a well-illustrated book containing many weather charts and diagrams.

Processed weather charts are published by the Weather Bureau, U. S. Department of Commerce, Washington, D. C., and are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings:

Coastal Warning Facilities Chart, Eastern Florida, 1965, Catalog No. C30.22/3:F 66/965.

Coastal Warning Facilities Chart, Morgan City, La., to Apalachicola, Fla., 1965, Catalog No. C30.22/3:M 82/965.

WHALING:

"International Whaling Commission, Chairman's Report on the Sixteenth Meeting," by M. N. Sukhoruchenko, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 54, no. 2, Feb. 1965, pp. 25-30, printed. Hvalfangerforeningen, Sandefjord, Norway. Reviews the order of business and work accomplished at the 16th Meeting of the Commission, held at Sandefjord, June 22-26, 1964. Discusses the previous season's (1963/64) whale catch, a report on the whale stocks in the Antarctic, blue-whale unit limitation proposals, protection of the humpback in the North Atlantic and of the blue whale in both the North Atlantic and the Antarctic, and protection of sperm whales. The report also covers North Pacific whale stocks, blood-typing, the Sanctuary and open season, taking of gray or right whales, the observer plan, infractions of rules in the Antarctic during 1963/64 season, and other items of discussion.

WHITEFISH:

"Akklimatizatsiya sigovykh ryb v Latviiskoi SSR" (Acclimatization of whitefishes in the Latvian S.S.R.), by G.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

P. Andrushsitis, article, Rybnoe Khozyaistovo Vnutrennykh Vodoemov Latviiskoi SSR (Fisheries of Latvian Inland Waters), vol. 7, 1963, pp. 211 214, printed in Russian. Akademii Nauk SSSR, Institute Okeanologii, Moscow, U.S.S.R.

CORRECTION

The June 1965 issue, page 97, showed this report, Gesammelte Sonderdrucke aus dem Institut fur Hydrobiologie und Fischereiwissenschaft der Universitat Hamburg 1963 (Collected Reprints from the Institute for Hydrobiology and Fisheries Science of the University of Hamburg, 1963), incorrectly under country heading GERMAN DEMOCRATIC REPUBLIC. The correct country heading should have been GERMAN FEDERAL REPUBLIC.

RING-AROUND-ROSY TUNA MACARONI CASSEROLE

Here's a grand tuna macaroni casserole designed for the busy mom by the Tuna Research Foundation. Ring-Around-Rosy Casserole is a snap to make and it's as nutritious and thrifty as you can get. Convenient canned tuna's high in protein. Condensed tomato soup, evaporated milk, and American cheese combine to add their own nutritional advantages in a smooth and tasty sauce that's a breeze to prepare.

You can make this casserole ahead of time, the day or night before you go shopping, and store it in the refrigerator. Then if you get stuck at the department store and are late getting home, all you have to do is heat and serve. It's child's play. (If you have a teenage daughter, you might tell her that. And ask her to set the table, too. Then you'll really have it made!)

RING-AROUND-ROSY TUNA MACARONI CASSEROLE

4 ounces elbow macaroni
1 can condensed tomato soup
$\frac{2}{3}$ cup evaporated milk
2 cans ($6\frac{1}{2}$ or 7 ounces each) tuna in vegetable oil
1 cup grated process American cheese, divided

Cook macaroni according to package directions. Drain and reserve. Combine tomato soup and evaporated milk. Add macaroni, tuna, and $\frac{1}{2}$ cup of the grated cheese. Turn into a greased $1\frac{1}{2}$-quart casserole; sprinkle remaining cheese around edge. Bake in 350° F. oven for 25 minutes. Or prepare early and refrigerate; then bake 45 minutes. Makes 4 servings.

DETERMINING AGE OF ALBACORE TUNA

Albacore fishermen, like fishermen everywhere, often wonder about the size of the fish they catch, and how many years it takes for an albacore tuna to reach a certain size. How old is a 28-pound albacore. How long will it take a 9-pound fish to grow that big to 28 pounds?

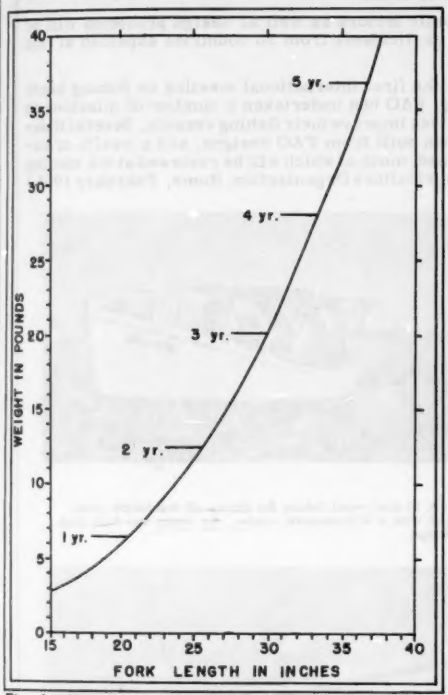

Fig. 1 - Chart shows the weight-length-age relationship of Pacific albacore tuna. If the length or weight of the fish is known, this chart will enable you to determine the other measure and its age.

Fig. 2 - This scale from a two-year-old albacore tuna illustrates the crowding of rings or circuli to form two bands or annuli.

The subject of albacore age and growth is of interest to marine scientists, but early attempts to interpret age from scales, vertebrae, and other structures were unsatisfactory in one way or another. Recently, however, biologists at the California State Fisheries Laboratory, Terminal Island, developed a method for cleaning and staining fish scales, and by using it have succeeded in determining the ages of albacore tuna.

Growth on albacore scales, like many other fish, is recorded as ridges or rings called circuli. When growing rapidly the space between rings is wide; when growth is slow a series of closely spaced rings form. If slow growth occurs at the same time each year, the resulting band of crowded circuli is an annulus, and the area between annuli is equal to a year's growth. By examining scales under a microscope and counting these annuli the age of the fish can be determined.

Biologists of the California State Fisheries Laboratory weighed, measured, and read the ages of numerous albacore tuna and then prepared a graph so anyone may estimate the ages of any albacore caught if either length or weight is known.

The measurement to use is fork length--a straight-line distance from the tip of the snout to the fork in the tail. So, a 28-pound albacore would be 4 years old and measure 33 inches, while a 9-pound fish measuring 23 inches fork length would be on its way to becoming two years old when caught. (Outdoor California, April 1964.)

SMALL VESSEL DESIGN TO BE REVIEWED AT FAO CONFERENCE

Fig. 1 - A vessel designed by FAO experts in the 1950's to be operated from open beaches in India. FAO did pioneer work in India with small mechanized craft.

The need for small fishing craft (under 100 gross tons) specially adapted for fishing local waters of developing countries will be the theme of the Food and Agriculture Organization's (FAO) Third International Technical Meeting on Fishing Boats, to be held at Goteborg, Sweden, October 23-29, 1965.

Social and economic factors as well as design problems will be reviewed by the 300 participants from 30 countries expected at the Goteborg meeting.

Since 1947 when the first international meeting on fishing boats was held at Goteborg, FAO has undertaken a number of missions to help developing countries improve their fishing vessels. Several thousand vessels have been built from FAO designs, and a wealth of experience has been gained, much of which will be reviewed at the coming meeting. (Food and Agriculture Organization, Rome, February 1965.)

Fig. 2 - An FAO prototype vessel going through the surf after launching from an Indian beach.

Fig. 3 - A 31-foot vessel fishing for shrimp off the Indian coast. Equipped with a 31-horsepower engine, the vessel was built to an FAO design.

Fig. 4 - One of FAO's pioneer experimental vessels designed in the 1950's for work in Ceylon.

Fig. 5 - A Senegalese vessel used for trolling and trawling. The vessel was designed in 1947 by an FAO fisheries expert.

Note: For additional details on plans for the meeting see Commercial Fisheries Review, May 1965 page 50.

HIGHLIGHTS IN THIS ISSUE (AUGUST 1965)

* * * Features * * *

HERRING FISHERY IN SOUTHEASTERN ALASKA
Use of this limited fishery by meal and oil processors (p. 1).

YELLOWFIN TUNA FISHERY IN EASTERN TROPICAL ATLANTIC
Effects of water temperature on catch (p. 7).

* * * Research and Developments * * *

Aluminum crimping sleeve for long-line gear eliminates electrolytic hook damage (p. 19).

Blue Crabs--cleaner-debacker machine semiautomates crab picking (p. 25).

Oceanography--submarine used to explore sea floor off Rhode Island (p. 50).

Shrimp--U.S. breaded and canned pack production (p. 53).

Tuna--new technique aids behavioral studies of captive live fish (p. 29); skipjack tuna appear in large numbers around Hawaiian Islands (p. 29).

Vessels--plastic and aluminum alloys used in construction (p. 97); push-button controls for new stern-trawler (p. 84).

Fish sticks going through the batter at a New England frozen fishery products plant. New products and convenience foods develop new markets and expand fish consumption.

* * * Foreign Fisheries * * *

AUSTRALIA: Reports on declining tuna catch; new products; fishery exports and trends (pp. 65-67).

JAPAN: Trends in major fisheries--tuna, sardine, salmon, crab--excellent results in summer albacore pole-and-line fishery (pp. 73-80).

MOROCCO: Continues long-range tuna fishing (p. 88).

SOUTH AFRICA REPUBLIC: Fish meal market shortage causes concern (p. 93).

SOVIET UNION: Offers to exchange tuna fishing data with Japan (p. 77).

VENEZUELA: Seeks investors for new fishing venture (p. 97).

YUGOSLAVIA: Extends territorial waters and Continental Shelf sovereignty (p. 98).

—— ALSO FISHERY NEWS FROM 16 OTHER COUNTRIES ——

* * * Federal Actions Affecting Fisheries * * *

Shrimp standards--interim amendment to U.S. standards for grades of frozen raw breaded products (p. 100).

Youth Opportunity Campaign--Fishing Industry asked to help (p. 58).

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Market reports--Reports on new vessels and new products--Summaries of State and Federal actions affecting fisheries--and reviews of recent fishery publications throughout the world.

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